• Rolls and Heavy Machinery Issue •

MEASURING a large Calender roll with indicating calipers designed to quickly gauge the accuracy of the rolls and measure the crown during the machining and final finishing operations. To the company making these rolls size is the accepted order of the day.

CONNECTICUT INDUSTRY

•JUNE• 1935

Pioneers in Industrial Fuels

NOT OLD in years—only a decade—but in that short span two important commercial movements have been successfully pioneered by T. A. D. Jones & Co., Inc.

The first brought higher grade bituminous coal to Connecticut by water in sufficient quantities to supply industry quickly and more economically than by previous methods.

The second, started but a year ago, has brought oil into the state for the first time as a competitive industrial fuel.

New River Navy Standard Coal
Pennsylvania Coal Industrial Fuel Oil

DOCKS: New Haven, Bridgeport DISTRIBUTION: R.R., Trolley, Truck, Barge

T. A. D. Jones & Co.

INC.

CONNECTICUT INDUSTRY

June 1935

VOLUME 13 NUMBER 6

L. M. BINGHAM, Editor

MANUFACTURERS' ASSOCIATION OF CONNECTICUT, INC.

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Does It Do Any Good to Write to Our Senators and Representatives?

By E. KENT HUBBARD

We are being asked this question repeatedly. Connecticut manufacturers have expressed their views to Connecticut Senators and Representatives on many occasions during the past and present sessions of Congress. With all sincerity they have given their opinions concerning certain pieces of legislation, only to find, in many instances, that they receive a "best intention" form reply, and to learn from the *Congressional Record* and the newspapers that their opinions were, apparently, given no consideration. Hence the question which is being asked so often and to which we think we ought to give general reply.

The reply is that it is the duty of every constituent of every Senator and Representative to convey his thoughts on any matter which affects him, his employes and his investors, and to which he has given thought and study. Furthermore, we feel that personal expressions do crystallize opinion.

Your Association has never lent itself to any plan, the desired result of which was to cause a deluge of general "vote for" or "vote against" wires to Connecticut representatives. In those cases where is was necessary to inform Connecticut manufacturers of certain pieces of pending legislation which affected them with which they might not be familiar, we have sent copies of the bill or an analysis, and have suggested voluntary action. We do not believe in propaganda of the "vote for" and "vote against" kind. We do believe that the present Congress is more sensitive to the opinion of their constituents than many Congresses in the past have been. This is but natural since no Congress, with the exception of the last, in the history of the country has ever had before it so many pieces of new and untried legislation. It is exploring uncharted seas. Most Senators and Representatives realize this fact and are cognizant of the further fact that they can know little of the final result of what they are doing. They know that the trial and error method is being overdone. Unfortunately, the Coughlins, the Longs, as well as many who may be counted as within the Administration, are propagandizing the members of Congress along the "vote for" and "vote against" plan. Many of them pretend that the thousands of wires and letters which they have received from persons who have no knowledge of legislation about which they write or wire do not influence them, but the fact of the matter is that the opinions now being registered in Congress do reflect this overly-advanced thinking. For the responsible citizen to sit idly by and resign himself to what is going on without lending advice and without protest, is to ignore duties of citizenship.

Manufacturing industry is the backbone of the state of Connecticut. Manufacturing industry of the country composes the *(Continued on page 27)*

FEDERAL AND STATE LEGISLATION

Federal

The legislative skies over Washington are full of threatening cloud patches hovering over business large and small. They thicken up, and thunder rolls out from Capitol Hill, but the lightning is still of the heat variety with frequent enough flashes to give business men the "jitters." When the "Socialites" pause for breath, the opposition takes a new lease on life; the clouds lighten but the sun never shines from an untroubled sky. All of which means that there is much threatening legislation pending with all outward appearances of sufficiently strong backing to pass with the aid of a reform-bent administration, but which to date never has been able to muster sufficient strength to do the job. But, despite the fact that business can't join wholeheartedly in singing the chorus of a once popular song "It Ain't Gonna Rain No More," current productive activity, together with stock and commodity markets seem to be more than holding their own.

But business as a whole won't discard its "umbrella of caution" until the legislative skies clear, and that seems a remote possibility with reform legislation as the chief diet of a Congress. The President has given out the general impression that he is willing to hold forth in the newly "air conditioned" White House during the entire torrid Washington summer, keeping the Capitol Hill boys at work until such time as they see fit to pass his "must" legislation, which has been dragging along for several months by long-drawn-out hearings and many revampings. Truth is that Congress is now beginning to be concerned with the constitutionality of some of its measures, therefore has moved more slowly, hoping for light to dawn with the decision in the Schecter Poultry Case, upon which the fate of NRA depends. Already Congress has had one set-back with the 5 to 4 decision of the Supreme Court against its new-born social measure—Railroad Pension legislation. That reverse has set the question marks to work, causing much re-drafting of legislation and more delays.

In some quarters there is a strong belief that Roosevelt will be forced to play with the radicals more consistently than ever if he wishes to forestall a third party and win the 1936 election. Reason is that 75 to 80% of business men are estimated to be anti-New Deal in varying degrees from bitter to lukewarm, thus alienating a group he had hoped to keep with him as in the early days of his administration. Other dopesters look for conciliation or a general toning down of all legislation plus a little "horse tradin' " in order to close the Congressional mill by early July without unduly disturbing business, which promises to do something if not saddled with too much regulation. Practically all the clouds of doubt that hung over business 30 to 60 days ago are still very much in evidence in the President's "must list" as follows:

NIRA Extension. Ten months extension voted in Senate as a "face saver" and "death potion" to forced business regimentation. House likely to vote a two year extension at behest of NRA lobby and certain business groups predicting dire results if NRA is not extended for a 2 year period. Labor president Green has also chimed in on the side of 2 year extension.

Utility Holding Company Bill. A substitute for the drastic Wheeler-Rayburn Bill was reported favorably by the Senate Finance Commitee on May 13. While holding to many of the provisions of the original measure, it exempted such companies as the Hartford Electric Light Co. which engage in interstate traffic to a small degree, from all restrictions and regulations imposed by the anti-holding company legislation.

Social Security. In its present frame of mind Congress seems bent on passing Unemployment Insurance and possibly some form of Old Age Pension plan, unless the persuasive powers of business groups opposing it become more potent than in the past, or another adverse Supreme Court decision shows up more definitely the unconstitutionality of such legislation. Certain portions of the opinion rendered in the recent adverse decision of the Supreme Court on the rail pension legislation would seem to indicate the unconstitutionality of the federal unemployment insurance and old age pension legislation, but the Congress, at the behest of the Administration, seems determined to place it on the books. House passed bill in April, but it is still held up in Senate.

Rail Legislation. Bus and Truck regulation to a limited extent, possible extension of rail coordinatorship and legislation to permit inquiry into railroad financing are scheduled to be listed among "work done" for this session.

Bank Bill. Passed House May 9, and now being heard in Senate with strong opposition from banking groups, including Connecticut. Despite opposition, at least modified bill along "central control idea" suggested by Federal Reserve Governor Eccles, is expected to pass.

Taxes. Excise taxes will doubtless be extended as rider tacked on NRA legislation by House Ways and Means Committee, with the idea that it will avoid the tax issue talk this session. It begins to look like a new tax bill will be necessary to feed the increasing number of government agencies. It will be avoided if possible.

Although not on the "must" list the Wagner Labor Disputes Bill is still a very grave threat hovering over industrial peace. Opposition from business is having some good effects but legislation of this type will be pushed to the end of the session.

Bonus. Patman inflation bill passed, vetoed, passed again by House but veto upheld by Senate. Bonus issue is still not dead and may yet be paid either by relief money or by some other bill yet to be raised in committee. Odds are against it this session.

Work Relief. Still in the plan stage with Hopkins as No. 1 planner. Hopkins, Walker, Ickes and Tugwell all have plans but they don't fit neatly together. Chances are grade crossing elimination and building of roads will be first attacks on unemployment made by $4.8 billion relief fund, of which not over half is likely to be spent in next 12 months.

(Continued on page 25)

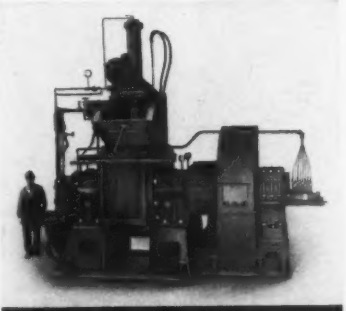
ROLLS AND HEAVY MACHINERY

By L. M. BINGHAM

Huge machines weighing hundreds of tons make the sugar for your coffee, form your rubber heels, turn out the linoleum on your floor, finish the paper you write on—and in countless different ways give you pleasure, comfort and convenience. They and the group of engineers and workmen who conceive and produce them are working indirectly, unsung, for the benefit of purchasers of over 50% of consumer products.

NOT long ago a forty-car freight train pulled out of the yards of the Farrel-Birmingham Company, Inc., at Ansonia, Connecticut. This extraordinary shipment, destined for a sugar plantation in Cuba, consisted of the parts for one sugar mill, which two months later was grinding 5,000 tons of sugar cane and turning out 500 tons of sugar every day. Yet the entire mill, equal in capacity to the largest in existence, was designed, built and shipped within three months from the date of order —a performance which has doubtless never been equalled. To drive this mammoth machine containing 18 huge rollers, each 42 x 84 inches, 3,000 H.P. are required.

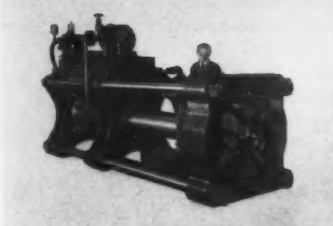
A paper company needed a calender stack to finish a sheet of newsprint 298 inches wide, 34 inches wider than had ever been made before. The engineering department buzzed with activity—frowned a little on finding that for the huge bottom roll it was necessary to build a new roll pit 30 feet deep, with a quadruple wall consisting of a steel caisson, a concrete wall, a waterproof lining and finally an iron casing, in order to have the space and the necessary freedom from moisture to cast a perfect roll of these proportions. Added to the problems of building a new pit free from dampness, was the necessity of building an entire new set of chills and installing new lifting equipment which included a 40-ton crane with a 50-ton trolley and an I-beam bracing-structure to strengthen the crane runway. To pour into the mold simultaneously 126,000 pounds of molten metal required two electrically operated ladles with capacities of over 30 tons each. In order to remove the 55 ton roll from the mold forming the bottom neck, a force of 60 tons had to be applied. One of the facing lathes in the roll shop had to be lengthened to accommodate this exceptionally long roll. The roll grinders, also one of the company's outstanding products, were found to be large enough to smooth-finish the roll down to its proper diameter of 36 inches. Behind its overall length of 405 inches, the longest in the world, 23 men posed abreast for a photo before the roll was boxed for shipment.



BANBURY MIXER

PLASTICATOR

TUBING MACHINE



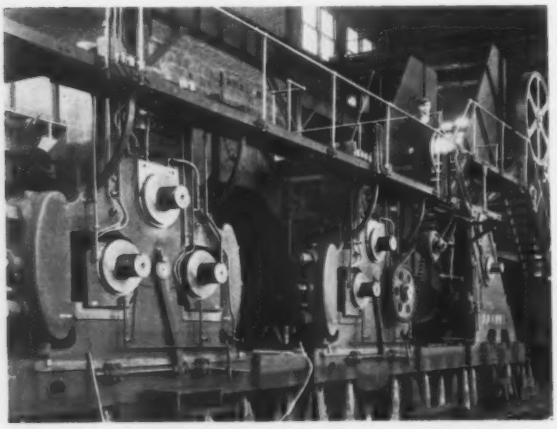
BALE CUTTER

Other unusual orders which have been carried out as a matter of routine by designers and workmen, used to thinking in "large dimensions," include a rubber belt press weighing a half million pounds, a metal flanging press of 1500 tons capacity, and a 200,000 pound, 156 inch two-roll linoleum calender. The list of "big" orders and "big" deliveries is seemingly endless, for "size" is the expected order of the day in the plants of Farrel-Birmingham at Ansonia and Derby, Connecticut, and Buffalo, New York, where 30 acres of floor space and normally 1700 persons are employed in catering principally to the large equipment needs of five major industries — rubber, plastics, metal, paper, and cane sugar. At the Connecticut locations are two foundries with an annual capacity of approximately 67,500 tons. Connected with each of the three plants, is a machine shop, all three combined having a capacity of approximately 90,000 tons of machinery annually.

The foundries with their six cupolas, two 30,000-pound air furnaces and a six-ton electric furnace are capable of making castings from one pound to 70 tons. To do the necessary machining work are 500 machine tools, including planers to take work up to 40 feet in length and 12 feet in width, and boring mills to swing 24 feet.

Rubber machinery, one of the principal products of the Farrel-Birmingham Company since Charles Goodyear started this industry by his discovery of the process of vulcanization patented in 1844.

Nearby is a roll shop with 30 roll grinders, over 100 roll lathes and numerous other machines capable of handling rolls 72 inches in diameter and 420 inches long. To keep materials and finished items on the move through production lines are nearly 1½ miles of crane runways, with 58



Part of a sugar mill, an important item in the Farrel-Birmingham varied line of products.

traveling cranes and 15 other cranes having a total lifting capacity of 1026 tons.

Added to these huge facilities in Ansonia are smaller areas such as a complete chemical and metallurgical laboratory, a large modernly equipped pattern shop and spacious quarters for executive, engineering and office staffs.

At the Buffalo plant are six of the largest gear generating machines in the world, made to generate spur, single helical, and continuous tooth double helical gears of the Farrel-Sykes continuous tooth type up to 20 feet in diameter, 54 inches face. This plant, taken over by the company about 1920 and subsequently used to produce Farrel-Sykes gears, gear units and gear generators, was originally a "war baby" producing sundry items for U. S. Navy destroyers. The Sykes gears, named for the inventor, who is associated with the company, are produced under a patent licensing arrangement and are known to the trade as the "gear with a backbone."

Behind all these grandiose facilities for production is a theme song hummed nearly a hundred years ago by the founders, but today sung with vigor by the executive and engineering staffs and the rank and file workers. The verses read: 1. Replace wherever possible general purpose machines with special purpose machines. 2. Transfer to the mechanism as much as possible of the skill formerly required of the human operator. 3. Construct the mechanism for continuous maximum rate of operation. After each verse comes the chorus, "New Records for Production and Precision are made on Farrel-Birmingham Machines." And when we follow Al Smith's advice and "look to the record" later on in our story, it will be seen why this chorus is "in the blood" of Farrel men and why it is enthusiastically set forth, sometimes with, and again without the verses, on all Farrel advertising literature.

Original Development

But when the Colburn brothers of Westville, Connecticut, first migrated to Derby and built a foundry there in 1836, which was the first cornerstone of the business, the theme song was far more simple, beginning and ending with coarse castings, such as those used as sash weights. It was known as the Birmingham Iron Foundry, since the community was then dubbed "Birmingham" after its English prototype, where it was once the ambition of Anson Phelps (Promoter of 3 brass companies—Wolcottville Brass Company, Smith & Phelps and Ansonia Brass & Copper) to establish a model industrial community. Shortly after the black panic skies of 1837 had cleared, the Birmingham Iron Foundry added a machine shop, and began to make mill machinery.

In 1850, a Mr. Sheldon Bassett came into control of the company and continued to develop it until 1890 when Mr. Henry F. Wanning, later assisted by his son Francis D. Wanning took over the reins of management. During the Civil War the Birmingham Iron Foundry took a prominent part in providing munitions for the Union Army, through the production of machinery for the rolling of bayonets and gun barrels, as well as rendering other important service incidental to foundry and machine shop work. It also produced during the World War a large amount of machinery principally for use at the Watertown Arsenal.

Throughout this company's career until it joined in a merger with the Farrel Foundry and Machine Company of Ansonia, to form Farrel-Birmingham Company, Inc., it specialized on heavy castings and mill machinery chiefly for the rubber and metal working industries. It was the first company in Connecticut and one of the first two or three in the country to produce chilled rolls used so extensively by the industries which Farrel-Birmingham now serves chiefly.

Throughout the company's history, it never compromised a creditor or had any reorganizations. From a total investment of $90,000 plus earnings, its capital stock grew to $1,250,000. It employed around 450 persons and did an annual business of over $1,500,000. Its floor area approximated 7½ acres.

Twelve years after the Birmingham Iron Foundry started to make rough castings, Franklin Farrel, then a young man of twenty, felt the lure for things mechanical, instead of being intrigued by the then popular craze for gold in California. Accordingly, he placed the neces-

A few of the roll grinding machines in the Farrel-Birmingham Roll Department, the largest specialty roll shop in America, equipped with over 100 roll lathes and 30 roll grinders.

sary belongings on his back and walked from his home in Waterbury to Ansonia where a brass industry was then getting under way, under the leadership of Mr. Phelps. Evidently foreseeing the industrial development that was to come, Franklin induced his father, Almon Farrel, an expert mechanic, to furnish the capital to go into the business of casting and machining power drives and gears.

Like so many of the early founders of Connecticut industries, Franklin Farrel first canvassed for orders, and after securing them returned to take his place at the bench to manufacture them. But he usually had to make a call on the local banker for funds prior to the start of operations on his earlier orders. Many of his first deliveries were made by heavy ox teams.

Because of the demand for rolling mills and other roll operating mechanisms in the fast growing brass industry of the Naugatuck valley, and for rolls and calenders in the infant rubber industry, started in Naugatuck by Charles Goodyear, the Farrel shop grasped opportunity by starting to produce the necessary machines, calenders and rolls. Because of the poor transportation facilities and the necessity for quick repair service in the Waterbury area, the Farrels started in 1851 a foundry and small machine shop in Waterbury. This branch plant, later, in 1880, was taken over by its manager, E. C. Lewis, and became the now very large and important Waterbury Farrel Foundry & Machine Company, the history of which will be told later under the heading of "Mill" or "General Production Machinery."

By 1853 the company had assumed the name of the Farrel Foundry & Machine Company, which it retained until the merger with the Birmingham Iron Foundry in 1927. Prior to the entrance of the Farrel and Birmingham companies into the business of casting chilled rolls, they had all been imported from England, but since then, many have been exported.

Farrel-Birmingham Hydraulic Presses are used in many industries. The 200-ton press illustrated here was built for a Connecticut airplane factory for forming metal parts for aircraft.

It was with Franklin Farrel that the present worthy theme song of Farrel-Birmingham first originated. Always alive to opportunity, he sought to build better and more precise production machines for the major heavy industries. First he built them for the power transmission group, then followed by catering to the needs of the rubber, linoleum and metal working industries. Shortly afterwards his company began making rolls and complete calenders for the paper industry. In 1870, it entered into competition with four other builders of large sugar mills for the West Indies trade, and some time before the merger was the sole survivor of the group. As early as 1890, Farrel Foundry and Machine shipped to Cuba machinery for two sugar mills, weighing 320 tons each, equipped with rolls 44 inches in diameter and 7 feet long on the face. During the World War the company produced gun carriages, shell presses and castings for the turbine engines in over 100 U. S. destroyers.

Thus, with a fixed determination to build well and to lead in paving the way to greater production records for one after another of America's large industries requiring heavy machines, Franklin and Almon Farrel expanded from their modest little plant of 1848 vintage to a modern industrial group on the banks of the Naugatuck River, covering over 13½ acres of floor space. And since the death of Franklin Farrel in 1912, at the ripe old age of 84, a branch plant was acquired in Buffalo which produces Sykes gears, gear units and generators and which, up until the merger with the Birmingham Iron Foundry, produced nearly one-fourth of the concern's output.

The name "Farrel" takes its place in the ranks of Connecticut industry along with a long line of others exampled by Chase, Seth Thomas, Sargent, Wallace, Cheney and Barnes, which have been identified with the establishment of nationally known industrial institutions.

Modern Development

Today, Farrel-Birmingham Company. Inc., goes even beyond the combined shadows and the high hopes and great ambitions of its early founders; it is a closely welded organization of the two oldest companies in the heavy machinery field and represents a time-tested coordination of engineering skill, plant facilities and financial responsibility which augurs well for continued progress in the development of machines to meet the future needs of industry.

In the intervening years from 1836 and 1848, respectively, when the two segments of the company were launched, lies the greatest period of industrial development both in the United States and the world. With such valuable lessons of experience to draw from, the world from which to gather its engineering staff and a modern laboratory to assist in carrying out the verses of the theme song, it is little wonder that the chorus, "New Records for Production and Precision are made on Farrel-Birmingham Machines," is so widely accepted by hundreds of the world's largest corporations.

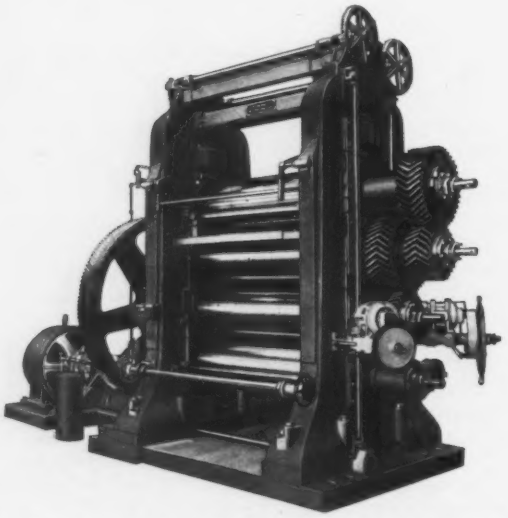
A recent inventory of engineering skill within the Farrel-Birmingham fold included the following:

1. From England came a mining engineer educated at the English Camborne and Penzance Mining Schools, and in electrical engineering, at Purdue University. Added to his broad educational background was experience in mining, marine and electrical fields which included that of acting as assistant to the inventor of carborundum and years of study in America and six foreign countries on rubber plant conditions. All told he has some 18 patents to his credit besides his basic patent on the Banbury Mixer, the greatest money and time saver ever introduced to the rubber and plastics industries for mixing the basic raw materials.

2. Another engineer, a native of New England, educated in the Middle West and at Cornell, developed the Gordon Plasticator for masticating crude rubber at enormous savings to the rubber industry. Among the eleven patents granted to him are improvements on the Schofield Bias Shear which has accounted for millions of dollars in production economies for the rubber industry. Many other developments in the rubber working machinery are also credited to him.

3. Still another engineer in charge of rubber and plastics machinery engineering is a native of Ansonia with a background of more than 30 years' experience in all fields in which the Farrel-Birmingham Co. operates and who has to his credit 28 U. S. patents and 25 foreign patents.

The engineering skill just outlined is but a small sample of that available in the far flung organization to which many nations have contributed of versatility, experience and inventive genius. Engineering experience in itself is not enough to qualify a man as a successful Farrel executive; that experience must be coupled with versatility and inventivness which is the result of the rare ability to sense the relationship between disassociated facts, applying the result to the creation of new and advanced mechanisms. Let us look to the work performed by the brain-children of the company's highly developed engineering staff.



A 26" x 78" Four-Roll Rubber Calender built for a rubber factory in Australia, for coating fabrics on both sides and other processes.

Banbury Mixers

The need for lower cost production, control of uniformity and quality coincident with the growth of the rubber and plastics industries, led to the development of the Banbury Mixer. It was a pure case of making a maximum transfer of skill to a mechanism which would reduce dependence upon the human element and increase the unit output with appreciable reductions in labor, power and operating costs. The outcome of long experimentation resulted in the introduction of the first Banbury Mixers in 1916 which had a limited application. Within a short time they had demonstrated that they embodied the correct principles for mixing in an internal machine. Numerous mechanical refinements and more rugged construction have been the outstanding improvements which have broadened the scope of this mixer and extended its use into many different fields of industry. Eight standard sizes are available from the Midget laboratory model taking a 3/4 pound batch of stock up to the largest production machine having a single batch capacity of 1000 pounds.

The processes to which the Banbury may be applied with assurance of obtaining better quality stocks, savings ranging from 50% upward in labor and power costs, savings in formula and handling costs, savings in floor space, cleaner operating conditions and better supervision and operating control are as follows:

1. Mixing and compounding rubber and plastics with filling powders, to be used in the production of automobile tires and tubes, rubber shoes, soles and heels, mechanical and other rubber goods.
2. Masticating or breaking down crude rubber.
3. Warming cold mixed stock for calender or tubing machine.
4. Massing and reblending reclaimed rubber stock.
5. Grinding or disintegrating various scrap materials.
6. Mixing or grinding pigments with a vehicle for paints, enamels and lacquers.
7. Densifying materials both with and without resin binders.

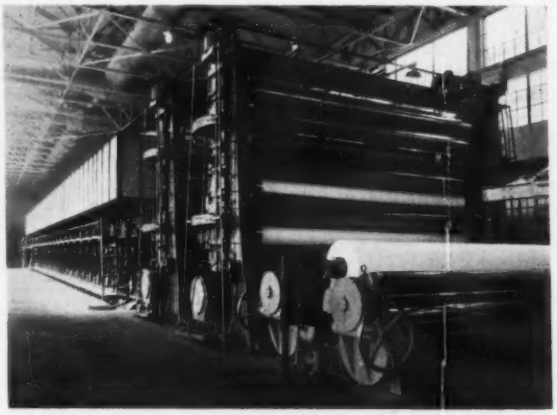
More than 700 installations of Banbury Mixers have been made in rubber, plastics and paint plants throughout the United States, Canada and several foreign countries and are now doing the work formerly done by several times that number of two roll mills. The list of users includes practically every rubber plant in the United States and many of the leading plastics, linoleum and paint and lacquer manufacturers.

Farrel-Birmingham has in its files literally volumes of "proof" of the superior performance of Banbury Mixers, both in the form of results from exhaustive laboratory tests and enthusiastic experience letters from customers. But for the "doubting Thomases" or those wishing to make actual tests just to be certain of results, there are available at the company's Derby plant and at district offices in Hackensack, N. J., Los Angeles, Calif., and Akron, Ohio, test machines for the prospective customers' convenience. To merely high spot the outstanding features, advantages and applications of the Banbury, the company last year published a 32 page bulletin which may give some idea how much there is to tell about this "saver of millions" for the rubber and plastics industries.

Rolling Mills

Located in the center of the brass industry of Connecticut, it was natural that early attention should have

been given to the building of rolling mills and other rolling mill equipment. Machinery of this kind continues to be an important part of the total production and the modern Farrel-Birmingham Rollings are outstanding examples of advanced engineering in this line of equipment for non-ferrous metals, such as brass, copper, zinc, lead, britannia metal, aluminum, foils, etc., and for cold strip steel. They have many improved features of design



Two Farrel Paper Calender Stacks installed in a North Carolina paper mill. Both are 236″ face, one having seven rolls and the other nine.

that bring about more satisfactory operating conditions, increased output, lower power consumption, minimum labor and maintenance costs and notably superior accuracy and precision.

An example is Farrel-Birmingham Copper Rod Mills which are designed to roll a diversified product of high quality at low cost. Low productive cost means high speed operation with a small operating force, low power consumption and minimum scrap. Automatic handling equipment reduces labor; maximum power saving is obtained by the use of anti-friction bearings throughout; and high quality with minimum scrap is assured by proper design.

Chilled Rolls and Roll Grinders

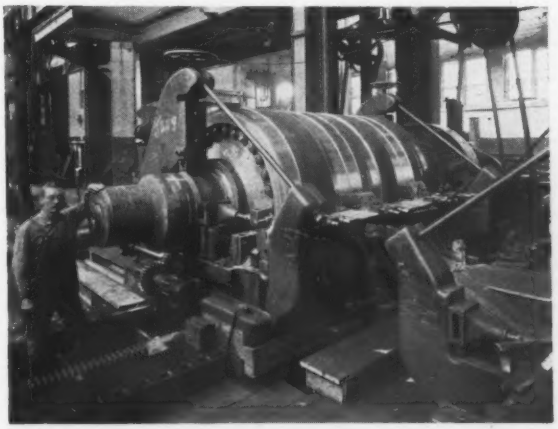
Principal component parts of Farrel's diversified line of heavy machinery for the five industries which it serves chiefly are chilled iron rolls. And second only in importance in the company's master plan of service, is the means to properly finish the rolls which become major units in their own machines and to keep them up to the highest point of efficiency after they reach the customer's plant. This is accomplished by the Farrel Heavy Duty Roll Grinders for roll and cylindrical grinding of all kinds, by the Two Wheel Swing Rest Roll Grinder for paper mill rolls and by other special grinders.

The chilled rolls are produced by pouring molten iron of the proper temperature and composition into molds for rolls which are built up in vertical position in deep pits set into the foundry floor. The molds are built up with a series of cylindrical chills piled one upon the other and coated on the interior with a specially prepared compound which serves as a parting coating and which also smoothes over the joints between the different chill sections. The neck ends or journals of the rolls are molded in sand and carefully baked at closely specified temperatures and the regular gray iron casting procedure followed, as it is not desired to have a chill on the journal surfaces.

When a casting has set and cooled sufficiently, the chills are removed and the roll lifted from the pit by a crane and placed on the foundry floor, after which the sand and the gates through which the metal was poured are removed. The next step is the machining process, done in a spacious well-lighted machine shop. The operations which follow in sequence are: centering; machining the necks, fillets and collars; machining chilled surface of roll, with a facing lathe using long flat tools held parallel to and moved up against the roll surface by means of screw, while the roll moves slowly at not more than six revolutions per minute; rough grinding operation with the company's own precision roll grinding machines; gauging during the grinding operation; the final precision grinding operation, gauging and inspection.

To finish the new Farrel Ni-Hard rolls, developed especially for the finishing of fine metals, it was found necessary to do the entire finishing operation by means of a one-wheel roll grinder of the company's own design, since the composition of the rolls is so hard that they were found impossible to cut with tools.

Farrel Roll Grinders for finishing all types of rolls are



Four broad cutting tools facing a 72″ diameter chilled iron roll for asbestos sheeting calender.

time tested in the company's roll shop in the production of rolls for its own products. This method removes all hazards of poor performance when a customer wishes to purchase a suitable grinder for refinishing the surfaces of the rolls when they show evidence of wear-and-tear leading to inferior workmanship on the finished product.

To discuss the different types of roll grinders and how they are built is too long a story to be included in the space available here. Like all other Farrel machines the grinders have in-built skill sufficient to produce the required shape, accuracy and finish with minimum dependence upon the skill of the operator. A typical instance of the performance of heavy duty roll grinders is to be found in the experience of one installed at the Follansbee Bros.

Co.'s. Toronto, Ohio, plant. This unit being set to do uniform precision grinding to predetermined standards has not only justified its cost by its reduction of rejects and seconds of high quality steel sheets, but also, in addition, has saved annually approximately $15,300 in the cost of new rolls because of reducing the amount of metal removed in finishing a roll by five thousands of an inch as compared with former methods. The amount mentioned is saved by the accurate grinding of 2700 rolls, which together with labor and power savings has yielded a return of 63.9% annually on the initial investment in the roll grinder.

Hydraulic and Power Presses and Miscellany

In addition to Farrel-Birmingham's chief production of rolls and heavy machinery for the five major industries previously mentioned, it also manufactures miscellaneous machinery for many other purposes including stone crushers, felt hardeners, hydraulic and power presses and accumulators, shears for plate, billet, bar and structural shapes, and special heavy machinery of various kinds. The company has also continued to produce its original line of castings, power drives and gears as well as other items classified under heavy transmission machinery. The hydraulic presses are made for a wide range of uses in the rubber, plastics, metals, paper and leather industries. The mechanical presses are used chiefly in the metal working industries, but are also used in compressing fibre or composition products.

Another production item of importance to Farrel customers is the Farrel Indicating Caliper which permits the detection of errors in roll accuracy down to one-quarter to one-tenth of one thousand of an inch—all of which saves valuable productive time and losses through spoilage of material (See workman on front cover using one measuring a large roll).

The scope of Farrel's activities falls under 18 broad classifications—1. rolls, 2. rubber machinery, 3. plastics machinery, 4. linoleum machinery, 5. celluloid machinery, 6. insulated wire machinery, 7. asphalt products machinery, 8. paint and varnish machinery, 9. asbestos machinery, 10. phonograph record machinery, 11. sugar machinery, 12. rolling mill machinery, 13. lead manufacturing machinery, 14. hydraulic and mechanical press equipment, 15. paper machinery, 16. heavy transmission machinery, 17. miscellaneous machinery, 18. foundry products. But the breakdown of these main classifications into sizes and types runs well into the hundreds, not to mention countless special tasks in heavy machinery, miscellaneous machine work and job casting work which the corporation is equipped to handle with dispatch.

Meehanite

In the modern chemical and physical laboratories have been developed and tested a number of different metal processes to improve the qualities of castings used in Farrel-Birmingham machinery, as well as for outside casting customers. Meehanite is an example of what can be accomplished by metallurgical skill in combining materials of the proper characteristics and accurate control of manufacturing processes. The result is an ideal metal for many types of castings which is superior to grey iron or semi-steel and an economical and reliable substitute for steel in some applications. "Meehanite" is a processed metal of high strength, close grain, uniform structure and unusual wearing properties. Its resistance to impact is two to three times greater than semi-steel and it can be furnished with a guaranteed minimum tensile strength of 50,000 pounds per square inch. Special compositions of "Meehanite" have been developed to resist either wear, high temperature or corrosion.

Distribution

To distribute the products of this $4,000,000 corporation, engineering salesmen travel out of branch offices in New York, Buffalo, Pittsburgh, Akron, Chicago, Los Angeles, and San Francisco. Special agents are located in Birmingham, Ala.; Dayton, Ohio; Seattle, Wash.; Portland, Ore.; Newark and Hackensack, N. J.; Denver, Colo.; Bluefield, W. Va.; Dallas, Tex.; Tulsa, Okla.; and Montreal, Canada. Paper machinery agents are located in France, Norway and Sweden. Company offices for the sale of sugar machinery are located in Havana and San Juan, Porto Rico, and agents are located in New Orleans; Pernambuco, Brazil; Buenos Aires, Argentina; Manila, Philippines. Inquiries are prompted through a continuous program of trade paper and direct mail advertising.

What Farrel Means to Consumer

And yet despite Farrel-Birmingham's outstanding accomplishments for industry for nearly a century, which have made tremendous savings possible to Mr. and Mrs. Consumer, enabling them to stretch their purchasing power over several times the number of pleasure, convenience and necessity articles possible even a half century ago, it is extremely doubtful if one person in a hundred, outside of industrial circles and the locale of the company's plants, has any knowledge of Farrel's great contribution to consumers everywhere. To say that a large proportion of the articles which the average person uses or comes in contact with every day, are affected favorably in price or quality indirectly by New Records for Production and Precison made on Farrel-Birmingham Machines, is no over-statement when materials in those products are traced back through production lines to their raw state.

Franklin and Almon Farrel and the Colburn brothers had the vision to start and make rapid strides toward the present day ramified development which affects everyone's pocket favorably. Henry F. and Francis D. Wanning assisted still further in making vast savings possible by improved heavy machinery. The company engineers and management of the present day are carrying on the esprit de corps of the founders on a much broader and more comprehensive scale.

Heading the organization today is N. W. Pickering, Commander in the U. S. Navy until after the World War, when he joined Farrel-Birmingham to advance through the roll department to the presidency in February, 1930. Vice-Presidents are: Carl Hitchcock and F. R. Hoadley at Ansonia, and A. G. Kessler, manager of the Buffalo plant. Other officers are: George C. Bryant, Sec.; F. M. Drew, Jr., Treas.; W. B. Marvin, Asst. Sec. at Ansonia; and L. K. Blackman, Asst. Treasurer at Buffalo, N. Y.

EDITOR'S NOTE. *This article is the 14th in a series on Connecticut Industries, eleven of which have discussed the growth of the several companies included in one industrial field. The other three, including this article, discussed only one company each, since that concern alone represented the industry in the state.*

MACHINE TOOLS

(CONCLUDED)

EDITOR'S NOTE. *In the May issue, the story of machine tools was traced from the real start of its development, in England, through the early American and Connecticut history. The individual histories of The Pratt & Whitney Co., The Bullard Machine Co., The Hendey Machine Co. and The Henry & Wright Manufacturing Co. were included in Part 1 of the machine tool story. In this conclusion are the individual histories of 14 other concerns specifically classified as machine tool manufacturers, together with mention of two other companies making one or two of these tools. To fall within the machine tool classification a company must be producing more than one major item of "machines that guide smaller tools in the cutting or chipping of metals."*

The Taylor & Fenn Company

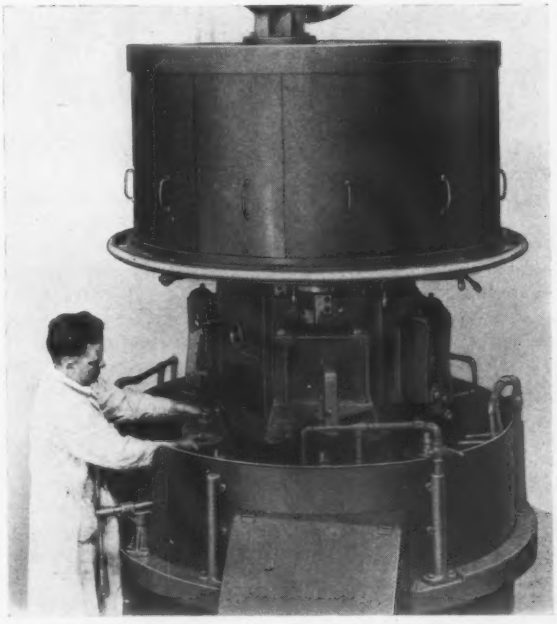
The business now conducted by The Taylor & Fenn Company was established in 1834 by Levi Lincoln. It originally occupied a building which had formerly been used for a woolen mill, located on Arch Street, on the banks of the Little River, and operated by water power. There is a tradition that this mill furnished the broadcloth that was worn by George Washington at his Inauguration. It is also of interest this Tercentenary year to note that this company is located on the site of the original house lot of Thomas Hooker.

Levi Lincoln, a descendant of Stephen Lincoln, an early Massachusetts settler, was in 1832 agent and manager of the New England Card Company, which made cards used in the manufacture of cotton and woolen goods. This firm at one time had the names of 900 women scattered about the country who were employed at odd times in setting the wire of the cards. Mr. Lincoln, being one of the old school of ingenious Yankees, who were forever improving and inventing new devices, either invented or greatly improved a machine for punching holes in the leather and for making and inserting the teeth in the cards, all of which put an end to the home work industry. By applying the same principles, he also invented the first machine to make hooks and eyes, for which the women of the world should be grateful to him. The hook and eye business, which started in earnest in 1860, was later sold to North & Judd of New Britain, where it became an important part of its business.

At the start of his venture, Mr. Lincoln's chief product was the manufacture and sale of molasses gates or faucets, which he invented to replace the old wooden ones. Castings for these were made in a number of foundries, notably one owned by Alvin Hyde & Company of Stafford, Conn. The boom of the molasses gate business, by 1840, encouraged Levi Lincoln to enlarge and to take into business with him his two sons, George S. and Charles L. Lincoln. The name of the company became George S. Lincoln & Company, the plant being known as the Phoenix Iron Works. A machine shop and foundry were started where machinery, pulleys and tools were developed and castings made for the company's own products.

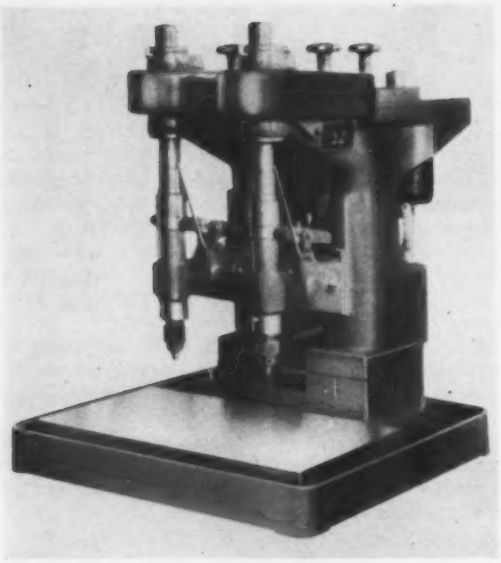
During the early development of the silk industry, a number of textile machines were made for Cheney Brothers. In fact, George S. Lincoln & Co. became known as the shop that could make most any kind of machine or tool and, therefore, was consulted by the metal industries then springing up, especially from 1840 until after the Civil War, when more competition came into the field to bid for the business.

About 1846, Levi Lincoln became interested with William Rogers in developing the electroplating process which later was used with success by Rogers Brothers and other silverware manufacturers.



THE MULT-AU-MATIC—A multiple spindle vertical tool, most popular machine tool made by The Bullard Co., Bridgeport. (History of company in May C. I. page 24.)

In the early fifties, George S. Lincoln & Company commenced making machine tools, particularly lathes and planers. Francis A. Pratt came with the company as superintendent and was soon joined by his friend, Amos Whitney, who became a contractor. Both of these men had previously worked at Colt's Armory. They grew to respect each other's abilities and, eventually, formed a partnership. Starting at first in a little room on Potter Street, the partnership eventually developed into the Pratt



TAYLOR & FENN Type S Two Spindle Super Sensitive Drilling Machine by The Taylor and Fenn Co., Hartford.

& Whitney Company. (See Pratt & Whitney History, page 23, *Connecticut Industry* for May.)

During the decade of the 50's, the machine tool business of the Phoenix Iron Works expanded to include practically all types available in those days. The Lincoln Milling Machine was developed and lathes, planers, punch presses, index milling machines, gear cutters and single and multiple spindle drilling machines were regularly manufactured. Large numbers of milling machines and machine tools of other types were furnished as part of the original equipment of Colt's Patent Fire Arms Manufacturing Company; also, many of the machines designed by E. K. Root, the inventive genius who was at that time superintendent of Colt's and afterwards became its president.

The Civil War brought its feverish flood of orders for machines to be used directly or indirectly by the Government. Large orders for Lincoln Milling Machines were received from the Springfield Armory and other Government shops.

At the same time that machine tools were being developed, another brother, Theodore Lincoln, came into the business, bringing with him the idea of making iron fences and other ornamental iron work. Notwithstanding his death, shortly after the Civil War, the business was carried on for about fifteen years, during which the foundry turned out architectural iron work, building columns, fences, fire escapes and other ornamental iron work so popular at that time.

Upon the retirement of the elder partner, George S. Lincoln, the management was for a time in the hands of Chas. L. Lincoln and his two sons, Charles P. and Theodore M. Lincoln, 2nd. About this time the firm became known as Lincoln & Co. and remained so during the difficult and unprofitable period of the 90's, after which, in 1901, the Phoenix Iron Works was incorporated by Charles L. Taylor (now head if the company and great grandson of the founder, Levi Lincoln), J. H. Kelso Davis, Edward D. Redfield and Walter L. Goodwin. In 1907, the name was changed to The Taylor & Fenn Company.

The company's present line of machine tools consists of Drilling Machines, Vertical Milling Machines, Duplex Spline Milling Machines, Spring Presses, Wet Tool Grinders and Hydraulic Internal Grinders. It also builds special machinery and operates a modern, well equipped foundry, producing gray iron and alloyed iron castings for strength and for resistance to wear, heat and corrosion.

Thus has one of the earliest machine tool builders of the state rounded out a hundred and one years in the same location. In that time it has also contributed much mechanical genius toward the upbuilding of other industries in Connecticut and elsewhere.

Present officers are: Charles L. Taylor, president and treasurer; John H. Buck, secretary; Halsted W. Hull, assistant treasurer; Leland G. Harwood, assistant secretary; George S. DeLany, machine shop manager and William W. C. Ball, foundry manager. Approximately two hundred are normally employed.

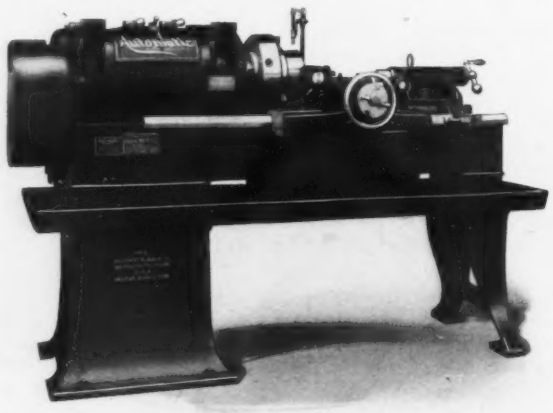
The Automatic Machine Co.

Established in a single story building, at Bridgeport, in 1896, by James Coulter to make automatic wire forming machines, the company expanded four years later to produce under the Coulter & Laws patents a thread cutting lathe. This lathe, adapted to the cutting of all types of high quality threads, reversed the carriage travel, withdrew and re-fed the tools and limited the depth of cut automatically.

In 1904, a marine type gasoline engine with an accompanying line of oyster culling machinery and gasoline motor driven hoisters, was placed on the market and is still carried, except that the engine design has been developed to cover large size industrial units using both gasoline and natural gas as fuels.

By 1908, when the company was incorporated for $2,000,000, increased business had caused it to secure additional floor space, and in the following year to acquire still larger plant facilities. Also, in 1909, The Pacific Iron Works, which had been established before the Civil War, was acquired.

Just preceding the World War, the Coulter Hob Miller, for cutting threads and circular forms, was introduced,



COULTER Automatic Thread Cutting Lathe by The Automatic Machine Co., Bridgeport.

being closely followed by the introduction of the Coulter Open Side Shaping Planer. During the World War the Automatic Machine Co. directed a large part of its production facilities to the manufacture of shell machinery, including timers, copper band cutters, threaders for shrapnel shell noses and plugs, mine sweeper units, gasoline motors, steering engines and gasoline hoisters for Emergency Fleet Corporation vessels.

About 1920, the high production requirements of the automobile industry led to the development of the Coulter Multiple Spindle Profiler for machining combustion chambers of engine cylinder heads. In 1925 the Coulter Diamond Tool Boring Machine was introduced, being the first of this type of tool to prove itself in all branches of machine production where precision, finish and quantity are necessary attributes.

In the same year the late Frank D. Dorman (died April 8, 1935) became treasurer and general manager of the company. Mr. Dorman, as a result of his long experience in the automobile field as vice president and general manager of the Maxwell-Briscoe Co., and with W. C. Durant in the formation of the original Chevrolet Motor Co., brought to the company a wise counsel, a sound judgment and managerial experience of inestimable value to the company.

The varied line of products now produced by the Automatic Machine Co. is sold direct and through dealer representatives throughout the country. The company maintains a complete machine shop and engineering departments.

The present officers of the company are: William R. Webster, president; James Coulter, vice president; Andrew J. Porter, secretary.

The Baird Machine Co.

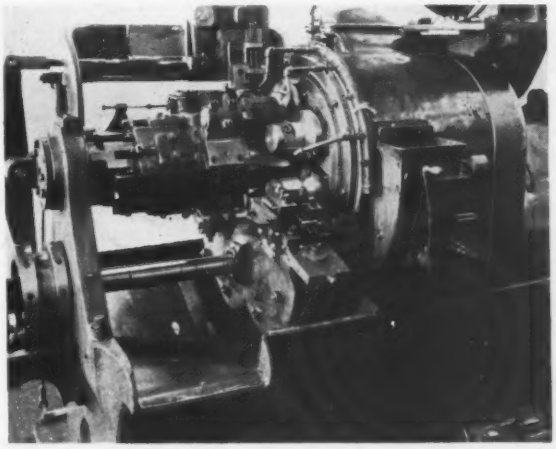
This company, now located in Bridgeport, has had a continuous career of solving different interesting production problems since 1849, when Joseph H. Baird started to improve tools for existing machines and to develop new ones when existing machines were found unsuitable. His efforts culminated in the development of a number of successful machines used to produce automatically such common articles as hooks and eyes, pins, buttons, hinges, paper clips, loops, zippers and many other articles made from wire and flat metal.

To Mr. Baird, the founder, the development of new tools to reduce the cost of the common articles to bring them within purchasing range of a greater number of people, was an intensely interesting and pleasurable mode of life. By force of necessity the present day management of the corporation he formed must seek to make a profit from operations, while Mr. Baird was chiefly concerned with the pleasure he derived from the miracle results of his many brain children, or as he often put it, "making the dern thing work."

In a strict sense of the word, the history of this company is more closely allied with the special machinery field than that of machine tools, since the latter field was entered only because the development of more automatic machine tools was a necessary means to the end that the price of more common products might be reduced through the use of more labor saving machinery. The chief items of development in the machine tool field are the Multiple Spindle Automatic Chucking Machine and the Multiple Spindle Automatic Grinder. Automatic presses, bench power presses and foot presses are also made.

During Mr. Baird's career, in which he invented machines that make fully 90% of the "little things" that have become part of our daily existence, he naturally became itnerested in improving the then crude method of finishing, which resulted in his development of a wide range of tumbling barrels. The Baird Machine Co. has developed from his ideas and now keeps in stock over one hundred and six combinations of tumbling outfits for shipment to all parts of the world.

Since Mr. Baird was born in Oakville, Conn., in 1827, and spent most of his early life in the vicinity of Waterbury, it is easy to understand why the Oakville Pin Co. (now a division of Scovill Mfg. Co.) the largest manufacturer of pins, paper clips, etc., grew up in its present location. Mr. Baird started work at the age of ten for Scovill & Buckingham Co. of Oakville (now Scovill Mfg. Co.). After a foray into business for himself at the age of 19 at Huntington, Conn., which was unsuccessful financially but served to get himself known widely as a man who could conceive and produce a machine that would do almost anything, he again worked for Scovill



BAIRD Automatic Six Spindle Horizontal Lathe or Chucking Machine (rear view) by The Baird Machine Co., Bridgeport.

& Buckingham, developing machinery. Later he worked for Benedict & Burnham (now part of American Brass Co.) and became interested in several other companies in Waterbury and started The Baird Pin Co., in Oakville. After disposing of his interests in Henderson Brothers, Waterbury, he then organized the Baird-Warner Co., a short time later changing its name to The Baird Machine Co. Among Mr. Baird's inventive contributions to the company he formed are machines that will take raw material and automatically turn out finished products at the rate of several hundred a minute; machines that count, number, discard imperfect goods, card pins and do practically everything but think.

Continuing on Mr. Baird's proposition that a "machine can be made to do anything that the fingers can do if it is not required to think," the present day management and its engineers have developed machines to assemble complete window shade rollers; a machine to automatically produce butt hinges; one to automatically produce "Weed"

tire cross chains; an improved model safety pin machine; a machine to automatically fasten circular erasers to a card; an automatic egg carton stringing machine and numerous others which are performing near-miraculous jobs for literally dozens of different industries. Unfortunately many of the most interesting sidelights in the company's history cannot be told because they are in the nature of special developments for individual companies.

The regular line of Baird products such as tumbling equipment and the machine tool items already mentioned are sold through dealers. The more varied specialized work is sold direct usually as the result of an inquiry leading to the development of some specialized machine after several conferences with one or more company engineers. Salesmen are not kept on the road because from the very nature of the specialized field, it has been found impracticable.

The present officers of the company are: Charles L. Warner, president and treasurer; B. C. Warner, vice president; Arthur J. Lewis, secretary.

American Chain Co., Inc.

Andrew C. Campbell Division

The Andrew C. Campbell Division of The American Chain Co. is, as its name implies, the outgrowth of the manufacturing efforts of Andrew C. Campbell, an inventor and manufacturer of Waterbury. Mr. Campbell, who had assisted in the development of many machines for use by plants in his native city of Waterbury, was presented with the problem of working out a cotter pin which would not "drop out" and probably cause an accident of more or less serious nature. During his lunch hour, he is said to have prepared a rough working model from paper clip wire which became the Campbell Hammer-Lock Cotter Pin, manufactured by a company organized in 1912, known as Andrew C. Campbell, Inc.

From this humble but important product that has been made by the millions to fill a constant demand, especially from the automobile industry, the Andrew C. Campbell Co. received the impetus which permitted the development of many other machines of great value to industry, notably Campbell Nibbling Machines, Campbell Abrasive Cut Off Machines, Robinson No-Trak Braiders and Campbell Hudorkut Cut-off Machines and a number of other special machines. Early in the company's history, Mr. Campbell became associated with Walter B. Lashar, president of the American Chain Co., Inc., and associated companies in the development of numerous automatic machines especially designed for the production of chain and kindred products, all of which led to the entrance of the company into the American Chain family of companies and to the removal of its factory from Waterbury to Bridgeport in 1931.

CAMPBELL Wet Abrasive Cut-off Machine by Andrew C. Campbell Division, American Chain Co., Inc., Bridgeport.

This group of 15 divisions and associate companies of the American Chain family have utilized Mr. Campbell's machine inventions to make products used in connection with nearly every human activity. These products include tire chains, automotive accessories, railroad specialties, welded and weldless chains and chain specialties for agricultural, industrial and marine uses, nibbling machines, abrasive cut-off machines, special machinery, chain hoists, automotive service station equipment, chain link and ornamental fence, farm and lawn fence, welding wire, traffic tape for guarding highways, high carbon wire and rod products in ordinary and stainless steel, wire rope and fittings, cable control assemblies for automobiles, disc type emergency brakes for trucks and buses, wrought iron bars, shapes and sheets, upholstery springs and spring units for mattresses and cushions, valves and fittings, malleable castings, electric steel castings.

In solving the many problems presented in making special equipment for the associate companies and divisions of American Chain Co., the Andrew C. Campbell Division developed certain machines that had a wide application throughout industrial plants generally, particularly the Campbell Abrasive Cut-Off Machines. The first cut-off machine used the dry process which is still desirable for certain applications. Later, however, certain conditions led to the development of Campbell Hudorkut Cut-Off Machine which makes the cut with the material submerged in a coolant or bath. Within the past year two new Abrasive Cut-Off Machines have been introduced, incorporating a unique new method of applying a coolant to the work while it is being cut. One of these machines is the Model 203 Wet Abrasive Cut-Off Machine which is designed for cutting bar stock, tubing and irregular shapes. The other is the Model 302 Horizontal Wet Abrasive Cutting Machine designed primarily for cutting flat stock. These machines are meeting with exceptional success in plants where materials must be cut off rapidly and accurately to close tolerances, leaving a smooth finish. They will cut almost any commercial material including alloy and ordinary steels, non-ferrous alloys of all kinds, plastics, glass, brick, tile and many other materials.

The Robinson No-Trak Braider for braiding cotton, asbestos or similar covers on wire and cable, has a particular application in the electrical and allied industries. Campbell Cut-Off Machines as well as Campbell Nibbling Machines are sold through a group of machine tool distributors located in the important industrial centers throughout the country. Officials of the company are: W. B. Lashar, president; W. T. Morris, vice president and general manager, W. M. Wheeler, secretary and W. F. Wheeler, treasurer.

The Geometric Tool Company

The Geometric Tool Company grew out of the early efforts of Anson Beecher and his four sons of Westville, Connecticut (now New Haven), to make matches. On the present site of The Geometric Tool Company the firm

of A. Beecher and Sons Match Company was started in 1850. The match making machines invented by the sons, particularly Ebenezer, revolutionized the industry. In 1870 the Swift & Courtney Company of Wilmington, Delaware, moved to New Haven and consolidated its interests with the Beecher Brothers. This combination, in 1880, formed the nucleus of the Diamond Match Company whose officers and principal plant were in New Haven until 1889 when they were removed to Chicago, leaving the New Haven factory vacant and a few talented employees out of a job.

William J. Smith, one of these employees, invented a drill to bore irregular shaped holes and interested the Beecher Brothers in it. In 1893 there was chartered under the laws of Delaware, The Geometric Drill Company to produce it. But since no one seemed to be interested in buying drills to cut geometric shapes, Mr. Smith dismissed, for lack of business, his entire force of two mechanics and a boy and began an earnest search for new products. In 1894, backed by the resources of Ebenezer Beecher, The Geometric Drill Company started to produce its first threading tools. Some idea of the size of the Company's early operations may be gained by the sales for the months of December, 1896, 1897 and 1898, being respectively $982.62, $3,419.87 and $3,633.70.

Early in 1896, Howard E. Adt became associated with the Company and under his leadership the Company began its upward climb. In 1905 the Company was reorganized under its present name. During the greater portion of the period of his connection with the Company, until his sudden death in 1923, Mr. Adt was president and general manager.

Succeeding him was James W. Hook, who became associated with the Company just two weeks previous to Mr. Adt's death. Under his leadership the entire shop equipment has been modernized and great advances made in the development of the Company's products, which divide themselves into four main sections* as follows:

1. Self-Opening Die Heads for producing external threads.
2. Collapsing Taps for producing internal threads.
3. Chasers or Cutters for Die Heads and Tap Heads.
4. Threading Machines and Chaser Grinders, including fixtures for same.

Naturally, among the largest items of manufacture are the Chasers or Cutters for use in the Tools mentioned, and since Chasers must be made to accommodate a wide variety of thread forms and pitches (the Company's stock ledger shows over fifty thousand different combinations), as well as different Die Heads and Taps, equipment to produce them must be versatile to perform rapidly and to gauge accuracy on a production basis. Accuracy and rapid production, therefore, are the impelling factors in the manufacturing program.

Briefly, the plant may be divided into three divisions:

1. Machine Shop in which Die Heads, Tap Heads, Threading Machines and Chaser Grinders are built.
2. Die Department in which Chasers or Cutters are manufactured.
3. Hardening Room fully equipped with the latest types of furnaces, controlling equipment and temperature recorders.

Superimposed on the whole shop is an elaborate inspection system consisting of both floor and final assembly inspection which not only checks and tests the merchandise products of the Company, but also keeps a constant eye on all production gauges, tools and fixtures by both optical methods and master gauges.

The beginning of this accuracy starts with the Purchasing and Planning Departments and ends with a final inspection which includes actual working application and test of work done by the finest light-ray projection measuring instruments capable of measuring to the millionth part of an inch.

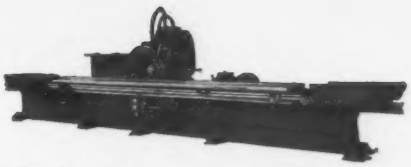
Space in this article will not permit of a description of the many different types of items made by The Geometric Tool Company under the four main classifications previously mentioned, but products can be summed up briefly by the phrase—"Tools and Machines for producing Screw Threads." Included under this heading are:

1. Self-Opening, Taper-Cutting and Solid Adjustable Die Heads and Chasers for them.
2. Collapsible, Receding and Solid Adjustable Taps and Chasers for them.
3. Threading Machines.
4. Chaser Grinders and Fixtures for them.

This is, perhaps, the briefest description of the Company's product. Countless specialized thread cutting problems are also solved by the engineering staff with the customer paying only the price for the tools made and tested as the answer to the problem.

The Company's policy in recent years has been to constantly stress the value of progressive equipment replacement as a means of lowering manufacturing costs. Its sales policy has never been one of aggressive salesmanship of the dominant type, but rather one which constantly seeks to make a product actually in advance of known demand. Such products lower sales resistance of other progressive manufacturers who are constantly seeking to reduce their costs and give greater values through the use of the most modern equipment. Highly trained direct salesmen traveling from the factory, and other trained sales and service men working for dealers, are the ones who move Geometric's products into the hands of industrial consumers.

The present officers of the Company are—James W. Hook, president and treasurer; James W. Sneyd, vice president; William B. Gumbart, secretary; Albert F. Breitenstein, works manager, and George A. Denison, sales manager.

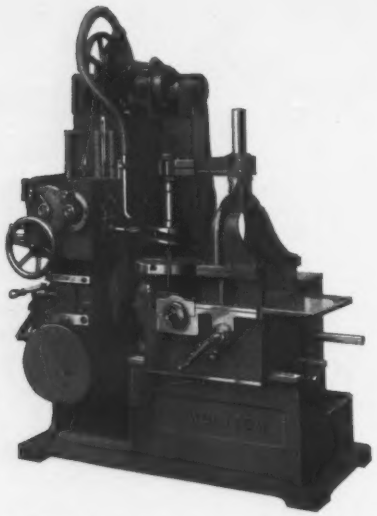


BRIDGEPORT Heavy Duty Face and Shear Blade Grinder with Hydraulic Drive by the Bridgeport Safety Emery Wheel Co., Bridgeport.

The Bridgeport Safety Emery Wheel Co.

In 1893 The Bridgeport Safety Emery Wheel Co. was organized by E. R. Hyde, C. L. Hyde and D. T. Homan. They had been for many years interested in the manufacture of grinding wheels and grinding and polishing machinery, and in 1893 started their own business in

* Illustrations of Threading Machine and Die Head on pages 7 and 10, May issue, *Connecticut Industry*.



CAM MILLING Machine by The Rowbottom Machine Co., Waterbury.

a small way on Knowlton St., Bridgeport. E. R. Hyde became one of the foremost designers of grinding machinery in the country and put on a practical basis the modern segmental grinding wheel for surface grinding.

Few people today realize the value of grinding in modern industry. Accuracy unattainable by other methods of machining is secured by grinding, saving untold amounts and speeding up industry. Without grinding, for instance, the automobile would probably cost 100 per cent. more than it does today.

The company specializes in the manufacture of wheels for tool grinding, knife grinding and face grinding. They make a wide range of grinding machines and were among the first in their field to make direct connected motor-driven grinders, also to use ball bearings. Their line now includes face grinders with hydraulic table drive, knife and shear blade grinders, floor grinders, tool grinders, swing frames, as well as buffing and polishing machinery and grinding wheels. Shear Blade Grinders for grinding shear blades up to 220" in length have been furnished to steel mills for regrinding blades and also to manufacturers of shear blades, paper knives, planer knives and other flat knives. The company in recent years has manufactured the "Abrasaw" Cut-Off Machine, equipped with a thin abrasive disk which cuts off small bars and tubes in a few seconds just as a buzz saw goes through wood.

Present officers of the company are: W. M. Hyde, vice president; H. N. Hyde, secretary; and A. H. Kean, treasurer.

The Grant Manufacturing and Machine Co.

The Grant Manufacturing & Machine Co., Bridgeport, Conn., was organized by J. Grant Kingsbury in 1900, as Grant Manufacturing Co., the company starting business in a small room on John Street over the machine shops of Walter Brothers. The principal product at the beginning was the revolution counter wheel, the figures being engraved by special machines invented by Mr. Kingsbury for engraving cylindrical surfaces.

Gradually other lines were added, such as metal patterns, screw slotting machines, tool-post grinders, general toolwork and special machinery.

In 1904, the company incorporated as The Grant Manufacturing & Machine Co., erecting a two story building on its present location, 90 Silliman Ave. At this time the company began building Noiseless Rivet Spinning Machines now consisting of several styles and sizes.

In 1912, it introduced the Grant Rotary Vibrating Riveter, adding in 1921 the Grant Double-end Automatic Chamfering Facing and Burring Machine and in 1923 the Grant Double-end Automatic Threading Machine, all of which necessitated, in 1926, the erection of a new building approximating 100 per cent more floor space.

The company's line of products also includes Pneumatic Riveters, Foot Power Riveters and Automatic Multiple Spindle Drilling Machines with dial feed. The Grant Manufacturing & Machine Co. now has branch offices in New York City, Chicago, Detroit and Cleveland, and does a world-wide business.

The present officers are: J. Grant Kingsbury, president; Wm. B. McNaughton, vice president and treasurer; H. O. Gustafson, secretary.

The Curtis & Curtis Company

In 1880, William D. Forbes was superintendent of the old Eaton, Cole & Burnham Co., now the Crane Co., Bridgeport, which manufactured pipe cutting and threading machinery for many years. This machine was known as the lathe type, which consisted of an ordinary lathe with a hollow spindle large enough to insert a pipe through, and a die on the tail stock.

BODINE No. 40 Dial Feed Tapping Machine by The Bodine Corporation, Bridgeport.

Mr. Forbes conceived the idea of building a pipe threading machine which did not screw the long, heavy lengths of pipe into the die, but turned the light dies around the pipe as is universally done when using a hand die stock, thus saving power, weight and cost.

Patents were granted Mr. Forbes on this invention in 1880 and, with a small amount of money supplied by Mr. Roderick P. Curtis, manufacturing was started in May 1882, in a small room with a few men, under the name of Forbes & Curtis.

In 1887, Mr. Forbes sold his interest to Lewis B. Curtis and the firm became Curtis & Curtis. In 1900 the firm was incorporated under the name of The Curtis & Curtis Co., and in 1909, on the death of Roderick P. Curtis, Lewis B. Curtis bought his brother's interest and became owner of the business.

The first factory was built by the Company in 1887 and enlarged from time to time until it now covers several times its original floor space. More than 30,000 machines of the Forbes type have been made and sold all over the world.

Lewis B. Curtis is president, treasurer and general manager; A. M. Curtis, secretary.

The Producto Machine Co.

Believing that there was a real need in industry for a high production automatic milling machine and also an opportunity to improve the service rendered, three experienced manufacturers, an attorney, a banker and an accountant organized The Producto Machine Co., of Bridgeport, April 6, 1928.

The organizers of the company were William J. Grippin, director and treasurer of The Bilton Machine Tool Co.; Frederick H. Rhodes of the Salts Textile Co.; H. C. Barnes, director and treasurer of the Wallace Barnes Co., Bristol; Jonathan Grout, attorney of Bridgeport; George H. Weber, member of accounting firm of Weber, Weber & Co., New York City; Edmund S. Wolfe, president and director of the First National Bank of Bridgeport; N. M. Marsilius, former director and president of the Bilton Machine Tool Co., and factory manager of the Woodstock Typewriter Co., Woodstock, Ill.

As the company began operations, it produced a medium sized miller known by the trade name of Producto-Matic Miller. The line has since been increased to include milling machines weighing from 500 pounds to 10 tons each to serve the entire metal working industry, but the greatest number of Producto-Matics have been purchased by the automobile industry. During the short period these machines have been produced a number of improvements have been made and patented and still others are in process.

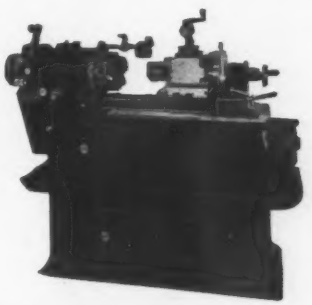
The Die Sets, used on punch presses for mounting punch and die in correct alignment, are made in a wide variety of styles as well as the accessories of every nature used by die makers and the metal stamping trade. Automatic feeds for presses are also distributed in order to round out a complete line of service to the entire metal stamping industry.

The Bodine Manufacturing Co.

The Bodine Corp. is the successor to The Anderson Die Machine Company, founded by Nils H. Anderson in 1910. The present management took over this business because, after twenty years' experience in the management of industrial enterprises, it was noted by Mr. A. V. Bodine, that drilling and tapping operations in the average shop were not scientifically considered from the production standpoint.

The equipment built by the corporation consists essentially of dial type drilling, tapping and screw inserting machinery. The early product was designed to fit particularly into the light electrical wiring devices business, and in that field it is the universally accepted machine. Recently the corporation has added to its line heavier machinery which is used extensively in the automotive and heavier equipment fields. All component parts are built in the corporation's own plant located at 1720 Fairfield Ave., Bridgeport, Conn., with the exception of motors, bearings and such parts as are conventionally purchased material.

Practically every order coming into the plant is a special order, calling for the production of some special part, and special tooling. This in no way indicates that the machine is not a general purpose machine but rather that the customer, at the time of purchase, has a particular problem that he wishes to solve. The machine has a wide range of application and is extensively used by companies producing screw machine products for secondary operations, which require an extremely flexible machine that can be adapted to a multiplicity of operations.



UNIVERSAL Semi-Automatic Thread Milling Machine by The Hanson-Whitney Co., Hartford.

The company's machines are sold through machinery dealers. It is safe to say that every home in the United States, where electric lights are used, possesses some part that has been processed on equipment produced by The Bodine Corporation or it predecessor.

Many interesting and unusual applications of the machine have been made, which are too numerous to catalogue in a brief description. The range of work covered may best be illustrated by saying that recent shipments of machines included a machine for drilling and tapping the small stirrups that go on the end of spectacle lenses and a machine which completely machines the gas pump cover for the Chevrolet car. This latter machine performed twelve operations and delivered 22 complete pieces per minute.

The company is headed by A. V. Bodine.

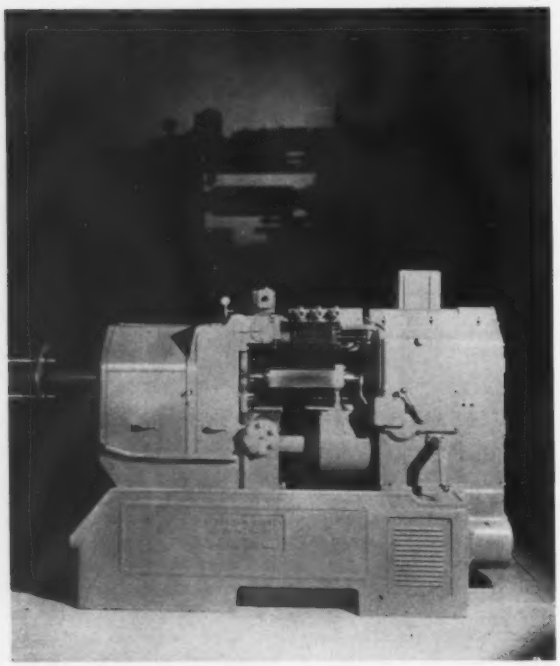
The Rowbottom Machine Co.

For 13 years prior to 1902, when he founded his own company—The Rowbottom Machine Co.—George H. Rowbottom was associated with The Waterbury Farrel Foundry & Machine Co., making certain consumer products. Associated with him were the late Messrs. William A. Robbins

and Hugh A. Pendlebury, but Mr. Rowbottom was the only active member.

At the start of his operations, Mr. Rowbottom made the same type of machines he had previously worked on at the Waterbury Farrel Foundry & Machine Co. factory, which included machinery for making cigarettes, carding hooks and eyes and other articles of metal, paper, thread, etc.

Since cams are very necessary and used in large quantities in connection with automatic machinery, the Rowbottom Machine Co. designed a machine for milling the cam grooves from a form, which permitted the rapid and accurate reproduction of any cam. The trade learned of this new invention and cam work was soon given to the company in such volume as to gradually crowd out the manufacture of special automatic machines. The Cam Milling Machine was also marketed at about



Model 41 New Britain Four-Spindle Automatic Chucking Machine.

the same time and has been so well received that it is now the company's chief product.

Distribution of the Cam Milling Machine is through direct sales efforts aided by advertising. Since cams are designed specially for each job, this job work is also solicited on a direct basis. They are used on all types and kinds of machines having automatic features.

Present officers of the company are: George Rowbottom, president and treasurer and Archer Rowbottom, secretary and assistant treasurer.

The Goss & De Leeuw Machine Co.

Organized December, 1922, the Goss & De Leeuw Machine Company, New Britain, entered the machine tool business for the purpose of developing and marketing what was then required, an improved and modern chucking machine.

Under the direction of Stanley T. Goss, president, former vice-president of New Britain Machine Company, and A. L. De Leeuw, formerly of Cincinnati Milling Machine Company, and until a few years ago conducting a consulting engineering business in New York City, there was designed and perfected a tool-revolving type, multiple spindle automatic chucking machine, incorporating many invalulable features which resulted in accuracy and high production, and simplicity in operation. The first year and one-half was devoted entirely to experimental work—actual production commencing during 1924.

Meeting with instant response in the market requiring this type of equipment, a constant growth has resulted, and at this time the company manufactures a complete line of both tool-revolving and work-revolving types—ranging in all sizes for machining parts requiring automatic machining.

The plant, which performs assembly operations only, is situated near the Berlin Depot, Berlin, on the main line of the N. Y., N. H. & H. R. R.

The machines manufactured are non-dependent on any one market but are largely used in the plumbing supply, automotive, house appliances, and electrical fields.

Present officials of the company are: Stanley T. Goss, president; A. L. De Leeuw, vice president; R. L. White, treasurer; John J. Black, secretary and A. J. Crozier, assistant treasurer.

The New Britain-Gridley Machine Company

The New Britain Machine Company, organized in 1895 to manufacture machinery, had as a nucleus for its business the J. T. Case Engine Company's location, machinery, and rights on a small high speed steam engine, which had been developed eight years earlier. It also had the machinery of the Dubuque Specialty Machine Company of Dubuque, Iowa, with its valuable pioneer patents on a Chain Saw Mortiser, a woodworking tool in which the cutting element was suggestive of the surgeon's chain saw.

A search for further articles to manufacture led to the acquisition, in April, 1911, of the Geo. G. Prentice Company of New Haven, Connecticut, the originator of a multiple spindle chucking machine, a device for boring, turning, and threading simultaneously, on several pieces of work held in chucks and automatically presented in turn to the succeeding tool positions. Here at one stroke was the opportunity of so subdividing work operations, carried on concurrently, that a greatly increased output from a single operator was obtained. Demand for the machine soon widened throughout the United States and to manufacturing countries all over the world.

In furtherance of this well-established principle of time saving, the Universal Machine Screw Company's automatic screw machine (a five spindle machine) was purchased in 1913. Concurrently with the production of the first two machines, development of a six spindle machine was carried on, and its successful completion formed the basis of the company's screw-machine business for years.

The advantages in economical production by the use of these machines naturally led the company to start a manufacturing department equipped with them. In a short time this department was turning out a daily output of 1,000,000 pieces which afforded a continouus proving ground for the machines in actual operation.

During the War, the company bent its utmost energies in the production of anti-aircraft gun carriages for the United States Government. It acquired land, buildings and operated a double shift, employing 1200 at maximum, with inevitable dislocation of some of its regular production operations.

In 1916, a method was devised for chucking work on a series of rotating spindles, in sequence, by the use of fluid under pressure. This procedure relieved the monotony of operating chucks by hand, added to the safety of the operator and eliminated the fatigue factor.

In 1925, a method was found to apply this same labor saving principle to the Prentice type of machine, on operations so rapid that chucks could not be opened and closed by the use of a wrench. To overcome this limitation of output previously controlled by the operator's agility, the machine was made to open and close the chucks merely by the turn of a fixed handle—an arrangement that not only stepped up production but also lowered the fatigue factor.

In 1929, acquisition was made of The Gridley Machine Company of Hartford, Connecticut, builders of automatic chucking machines, and the name of that company localized by corporate change to The New Britain-Gridley Machine Company. The new company took over all the machine building of The New Britain Machine Company, which continued with undivided attention as products manufacturers and makers of shop furniture.

The later screw and chucking machines of most advanced design permit of highest spindle speeds taking full advantage of latest developments in cutting speeds with alloy steel tools. These tools are most rigidly guided in special ways to insure long tool life and bid fair to force the obsolescence of other tools to the point where they will be too unprofitable to run.

Present officers of The New Britain-Gridley Machine Co. are: Herbert H. Pease, chairman of the board and president; George O. Gridley, Ralph S. Howe, Donald H. Montgomery and Edward L. Steinle, vice presidents; Ralph S. Howe, treasurer and Robert S. Brown, secretary.

The Hanson-Whitney Company

Development and marketing of the inventions of the late B. M. W. Hanson was the dual purpose sought in the formation of The Hanson-Whitney Machine Company by Mr. Hanson and the late Clarence E. Whitney, July 12, 1919.

Prior to opening his engineering bureau for experimental work which led to the formation of the company, Mr. Hanson had worked as a mechanic for 5 years at the Waltham Watch Company, for 20 years through the ranks to vice president and general manager of Pratt and Whitney Co., and for several years as superintendent and vice president and general manager of Colt's Patent Firearms Mfg. Co. During this long and fertile experience, Mr. Hanson had developed a number of machines and introduced improvements on others, all of which led up to a desire to form his own company.

The first machine developed by the new company was a Universal Vertical tool and Die Shaping Machine designed particularly for die work as its name implies. Shortly afterward a Universal Semi-Automatic Hob Thread Milling Machine was added to the line and is now in general use by manufacturers who have short accurate threads to mill upon a production basis. The third item introduced was a Rapid Precision Centering Machine which was designed to center cold rolled material or parts produced on turret lathes from bar stock. This machine is said to have features not included in any other centering machine, such as the novel quick acting chucking arrangement, the back resting of the work and the shaving of the center upon one side to produce extreme accuracy.

During December, 1924, the business of the Hanson Tap and Gage Co. was combined with that of the Hanson-Whitney Machine Co., and also to the latter line were added small tools, such as taps, gages and lead screws. The process of furnishing the lead screws, after hardening, was also by a special secret process developed by Mr. Hanson.

Although the Hanson-Whitney lines of machine and small tools have very broad application in a diversified group of industries, they are probably used to a greater extent in the automobile field than in any other.

The present officials of the company are: E. A. Hanson, president; C. E. Wertman, vice president; Park C. Boyd, secretary.

Another company which produces machine tools but whose history was published in connection with the story of "Chucks" in the February issue, is the D. E. Whiton Machine Co. of New London, Conn. This concern, by strict analysis of sales, produces far more machine tools in terms of dollar products, than of chucks. Its two chief items are Whiton Gear Cutting Machines and Whiton Centering Machines. Both lines are comprehensive including machines of special construction as well as attachments to handle all kinds of work lending itself to operations on these types of machines.

The Sigourney Tool Co. of Hartford is another company with an interesting manufacturing history of 55 years which produces one item in the machine tool field—namely, Sigourney Sensitive Drilling Machine. This machine is made in several models, from the so-called plain bearing type to the current high speed precision ball bearing machines.

The story of the company will be told either separately or under a different grouping in a later issue, since the greater portion of its product today is in the bookbinding machinery field for which the company is best known throughout the world.

Conclusion

There are many other companies in Connecticut manufacturing machine tools which are classified as "Special", and doubtless still others making one or two machine tool items, which the writer has unintentionally overlooked, or which he plans to treat in later articles. "Special Machinery" and "Mill Machinery" are the two remaining groups in the Connecticut machinery field whose histories are yet to be told.

The stories of the companies in these classifications share the same antecedents as described in the first part of the story of "Machine Tools" in the May issue.

From the late 1700's to the present is only a fragment of time in the history of man, but during that period, especially the last 75 years of it, the entire course of civilization has been changed by a comparatively few men who conceived and carried out the building of hundreds of thousands of "machine slaves." Connecticut, although not ranking as high as some other states in dollar output of these "slaves," has wielded through its great inventors, in terms of dollar products, than of chucks. Its two chief skilled workmen and management, a progressive influence on machinery development outweighing that of any comparable area on the earth's surface.

SERVICES AT YOUR DOOR

An alphabetical list of accessible services recommended to Connecticut Industry readers

HADFIELD, ROTHWELL, SOULE & COATES
Certified Public Accountants
Hartford — Stamford

HENRY KNUST
Certified Public Accountant
Conn. and N. Y.
15 Lewis Street — Hartford

Scovell, Wellington & Co.
ACCOUNTANTS AND AUDITORS
First National Bank Bldg.
New Haven
Offices in Principal Cities

Rates for this space exceptionally low

COAL
T. A. D. JONES & CO., INC.
24 hour service to Connecticut Industries
New Haven — Bridgeport

ENGINEERS—MANAGEMENT
Scovell, Wellington & Co.
First National Bank Bldg.
New Haven
Offices in Principal Cities

DIESEL ENGINES
WOLVERINE MOTOR WORKS, INC.
6 Union Ave. — Bridgeport

ENGRAVERS
DOWD, WYLLIE & OLSON
Advertising Art & Photo Engraving
106 Ann St. — Hartford

FENCING
THE JOHN P. SMITH CO.
Distributors for Page fence. Manufacturers of Wire Cloth,
497 State St. — New Haven

Ask about rates for one or more of these spaces.

L. HERES DE WYK & SON
Engineers
Ansonia — Connecticut
Zeh & Hahnemann Co. Presses

. . . Query

Readers desiring to purchase merchandise or services not listed here will be given the names of reliable firms upon inquiry to this department.

. . . Listing

Copy for listing in this department must be received by the 15th of the month for publication in the succeeding month's issue. We reserve the right to refuse any listing.

FREIGHT FORWARDERS
PITT & SCOTT CORP.
Foreign Freight Forwarders
27 Beaver St. — New York City

Ask about rates for one or more of these spaces.

INSURANCE
AMERICAN MUTUAL LIABILITY INS. CO.
Workmen's Compensation Ins.
Boston - Bridgeport - Hartford

Rates for this space exceptionally low

PRINTERS
THE CASE, LOCKWOOD & BRAINARD CO.
Printers and Binders
Trumbull St., Hartford

RECORDING INSTRUMENTS
THE BRISTOL COMPANY
Recording and Controlling Instruments
Waterbury - Connecticut

TRANSPORTATION
AMERICAN-HAWAIIAN STEAMSHIP CO.
Coast-to-Coast Freight Service
New York — Boston

DOLLAR STEAMSHIP LINES, INC., LTD.
Inter-coastal—Far-East and Mediterranean freight steamer Service
New York — Boston

Ask about rates for one or more of these spaces.

NEWS FORUM

Stevens Elected President of International. Evarts C. Stevens of Meriden, Conn., was elected president of the International Silver Company at the monthly meeting of the board of directors on April 24th. Mr. Stevens, former vice president of International, succeeds the late Clifford R. Gardinor, who died April 6th at the Meriden Hospital after a gall bladder operation.

Roy C. Wilcox, former lieutenant-governor and secretary of the company was elected executive vice president; Craig D. Munson, vice president; William H. Race and Alpeck L. Zeitung were elected directors.

At the present time Mr. Stevens is chaiman of the Open Shop Conference of Connecticut and also a member of the emergency advisory board. He is also director of the Manufacturers' Association of Connecticut, Inc., the Manufacturers' Association of Meriden and is also a member of the executive board of the southern Connecticut branch of the National Metal Trades Association. He is vice president of the Dime Savings Bank of Wallingford and a director of the Manning Bowman Co. of Meriden.

* * *

Industrial Conference to Meet in June. The 11th annual Connecticut Industrial Conference will be held at Camp Hazen on Cedar Lake, near Chester, Conn., on Saturday, June 15th, under the auspices of the State Industrial Council of the Y. M. C. A., of which Alpheus Winter, manager of the Bridgeport Manufacturers' Association, is chairman. The conference theme will be "Security."

The social aspects will be discussed at the morning session under the leadership of Dr. E. Wight Bakke, Institute of Human Relations, Yale University, who has made important studies of unemployment insurance in England and elsewhere. The economic aspects will be taken up at the afternoon session with a nationally known industrial executive as the main speaker.

At the evening session, a panel discussion participated in by representatives of several Connecticut industries under the chairmanship of Prof. Hudson B. Hastings, head of the Applied Economics Section, Yale University, will conclude the program. The Keystone Quartette of the Pennsylvania Railroad will furnish music, and group singing will be in charge of William A. Carpenter of Waterbury and Lucius S. Rowe and Edward R. Dejon of New Haven. Excellent recreational facilities are available at the camp.

C. W. Dunlop, manager, Safety Car Htg. & Ltg. Co., New Haven, is in charge of attendance, which promises to surpass last year's record of 320 men.

* * *

H. H. Pease Honored by Durable Goods Industry. H. H. Pease, president of the New Britain-Gridley Machine Company, New Britain, Conn., has recently been named Councilor to the Durable Goods Industries Council, which is following out the plans decided upon some time ago by the Durable Goods Industries Committee, requesting all of the heavy industries to appoint a councilor, each to serve as a point of contact between the Committee and the industries.

Pond Made Vice President of Pratt and Whitney Company. At a recent meeting of the Board of Directors of the Pratt & Whitney Company, Hartford, Charles M. Pond was elected a vice president.

Mr. Pond is a graduate of Columbia University, a member of the Indian Hill Golf Club, the Columbia Alumni Club of Hartford, the Hartford Club and the Hartford Chamber of Commerce.

* * *

MAPI Sees Large Potential Orders for Machinery. According to a recent announcement through John W. O'Leary, president of the Machinery and Allied Products Institute of Chicago, machinery manufacturers of the nation may look forward to receiving approximately seventeen and one-half billion dollars in overdue orders as industry replaces equipment worn out and made obsolete during the past five years. This statement was made at the recent completion of a nation-wide survey of "needed machinery" accumulating since 1929. The institute's statement claimed that 4,000,000 laborers would receive 65 percent of each dollar invested in the new equipment, or approximately twelve billion dollars of the projected amount which the needed machinery would cost.

* * *

Gray to Make New Products. Two new products of Electric Steam Generators, Incorporated, will be manufactured by the Gray Telephone Pay Station Company, according to a recent announcement made by the latter.

The devices are a toilet seat sterilizer and an electric steam generator which combines as a single product. The article is scheduled to go into production about June 1.

The telephone company's contract provides that the Hartford firm shall have the exclusive manufacturing rights for the United States during the life of the patents, and that any patent improvements made by the Gray Company will become the property of the Electric Steam Generator Company. It is also reported that the Gray Company will undertake the merchandising of the products. The first seats produced were scheduled to be installed in Radio City, New York, and later ones will probably be installed by the Pullman Company and two New York department stores as well as in a large number of Standard Oil Stations. The present plan is to install them entirely on a lease or rental basis.

* * *

Cheney Bros. Petition for Reorganization. Cheney Brothers, silk manufacturers of South Manchester, Conn., filed a petition to reorganize under the provisions of 77B of the Federal Bankruptcy Act on Friday, April 24th. The petition was filed with Judge Edwin S. Thomas in the United States District Court. An order continuing the present management, pending the submission of a plan for reorganization, was issued by Judge Thomas and the hearing continued until May 20, when a plan for reorganization may be presented.

The petition prepared by Robinson, Robinson & Cole, counsel for Cheney Brothers, revealed that the company's fixed assets consisting of land, buildings and equipment were valued at $7,182,934; investments $24,364. Liabilities consist of 5 percent five year bonds due November

1, 1937 in the amount of $2,659,000, reserve for interest due November 1, 1937, on 5 year bonds $265,900. Authorized capital consists of 27,160 shares of participating preferred and 68,905 shares of no par common stock.

The current assets as of April 24, unaudited, total $2,167,266 of which $2,033,000 was in inventories. Current liabilities were $529,059 consisting of notes payable $50,000; drafts $13,209; salaries and wages payable to May 10, $92,078; accounts payable $76,153; taxes payable $220,044; accrued liabilities $11,100; interest on bonds due May 1, $66,475.

* * *

Peck Brothers & Co. to Close Business. The plant of the Peck Brothers & Co., one of the oldest industrial establishments in New Haven, will be closed as soon as orders now on hand have been filled, according to an announcement made on May 15th. The firm manufactures plumbers' supplies.

The closing of the plant which was established by Henry F. and John Peck in 1856, is a result of a court order given to E. Holbrook Bradley, receiver for the company.

* * *

Death of Thomas J. Curtin. Thomas J. Curtin, 73, of New Britain, who was superintendent of the Corbin Screw Corporation plant for many years prior to his retirement, died at his home Sunday, April 21, after a month's illness. He had entered the employ of the Corbin Screw Corporation as a boy, remaining with the company for 25 years, rising to one of its most responsible positions before his retirement.

* * *

Electro-Platers' Program Completed. The program of the American Electro-Platers' Society, which is staging its 1935 annual convention and exhibition at Bridgeport, June 10-13, inclusive, has just rounded out its program of technical paper presentation, plant visitation and pleasure events. Registration headquarters are at Hotel Stratfield but some of the sessions will be held at the Mosque Temple. The program follows:

Monday A. M., June 10, 1935

8:30 Registration HOTEL STRATFIELD

9:00 Welcoming of delegates, members and vistors
Ray O'Connor, Chairman, General Committee
Joseph Sexton, President, Bridgeport Branch
Welcome to Bridgeport
Mayor of Bridgeport
Opening Session
Charles H. Proctor, presiding
Founder of A. E. S., 1909
Presidential Address—"The A. E. A."
H. A. Gilbertson
Business Session
Presentation of Credentials
Submission of amendments to constitution

1:30 P. M.—EDUCATIONAL SESSION—MOSQUE TEMPLE
William Phillips, presiding
Chairman, Research Committee
1. The Manufacturer and the Plater
A. P. Munning, Hanson Van Winkle Munning Co.
2. Report of Research Work
Dr. William Blum, U. S. Bureau of Standards
Paul V. Strausser, A. E. S. Research Associate
3. The Effect of Different Acids on Cold Rolled Steel
E. T. Candee, Chief Chemist, American Metal Hose Co., Waterbury, Conn.
4. The Adhesion of Electrodeposits
Walter R. Meyer, Research Chemist, General Electric Co., Bridgeport

Tuesday, June 11, 1935

9:00 A. M.—HOTEL STRATFIELD
NEW ENGLAND SESSION
Thomas H. Chamberlain, presiding
1. Black Nickel Plating
Joseph Downes, Remington-Rand, Inc., Middletown, Conn.
2. Plating Antimonial Lead
Clarence Hemle, Walter R. Meyer, General Electric Co., Bridgeport
3. Barrel Finishing, Plating and Burnishing
William Delage, The Oakville Div., Scovill Mfg. Co., Oakville, Conn.
4. Spotting Out of Plated Cast Iron
Walter W. Rowe, North and Judd Co., New Britain, Conn.
5. Electroplating Zinc Base Die Castings
Charles Costello, C. Cowles Co., New Haven, Conn.
6. Coloring of Metals
Harry MacFayden, Arrow-Hart & Hegeman Electric Co., Hartford, Conn.

7:45 P. M.—HOTEL STRATFIELD
Dr. William Blum, presiding
1. The Mechanism of Electroplating
Dr. Hiram Lukens, University of Pennsylvania, Philadelphia, Pa.
2. Spectograph Analysis as Applied to Electroplating
Dr. D. T. Ewing, Michigan State College, Lansing, Mich.
3. X-Ray Diffraction of Metals
Dr. H. R. Isenburger, St. John X-Ray Laboratories, Long Island City, N. Y.

4. Measuring Thickness of Electrodeposits With a Microscope
   Dr. Carl Heussner, Technical Director, The Chrysler Corp., Detroit

Wednesday, June 12, 1935

7:45 P. M.—Mosque Temple
President H. A. Gilbertson, presiding

1. Air Conditioning of Plating, Buffing and Lacquering Rooms
   A. W. Knecht, Consulting Engineer, Graybar Building, New York City
2. Brightening Up the Plating Room
   J. A. Coolahan, Hercules Powder Co., Wilmington, Delaware
3. Why Metals Corrode
   Dr. Robert A. Burns, Asst. Chief Chemist, Bell Telephone Laboratories, New York City
4. Methods for Prevention of Season Cracks of Brass in Electroplating
   B. J. McGar, Assistant Chief Metallurgist, The Chase Companies, Waterbury, Conn.

Thursday, June 13, 1935

9:00 A. M.—Hotel Stratfield
Thomas A. Slattery, Vice-President A. E. S., presiding

1. Electrodeposition of Tin
   E. A. Shields, Chief Metallurgist, Westinghouse Electric and Manufacturing Co., Springfield, Mass.
2. Optimum Metal Concentration of Nickel Solutions
   Dr. D. A. Cotton, Chief Research Engineer, Delco-Remy Corp., Anderson, Ind.
3. The Relative Value of Accelerated Corrosion and Outdoor Exposure Tests
   Dr. William Blum, Chemist, U. S. Bureau of Standards, Washington, D. C.
4. Adventures in Electroplating Copper from Ammoniacal Solutions
   Dr. E. A. Vuilleumier, Dickinson College, Carlisle, Pa.

Highlights of the social events will be a dance on Monday night, June 10, a buffet luncheon, afternoon relaxation and games and a shore dinner at Seven Gables Inn; the final and most important being the banquet and dance at the Hotel Stratfield on Thursday, or final event of the convention. Arrangments have also been made to entertain the ladies each afternoon and evening with style shows, cards and other games, sight seeing tours, etc.

Together with a large number of exhibits at the Mosque Temple, the plant visitation, arrangments for golf and other sporting events and the opportunity to visit many Tercentenary exhibits and other points of interest—all of which have been mentioned previously in the May and April issues of *Connecticut Industry*—round out one of the most complete programs ever arranged by the American Electro-Platers' Society. The convention committee urges visitors to register as soon as possible upon arrival, and has arranged to have a member of its committee on hand at the Stratfield Hotel to handle such reservations for those who arrive on Sunday, June 9th. Members and visitors planning to use the rails are advised to obtain a certificate which entitles them to the reduction on their return ticket (in the event 100 use this method). Visitors and members will be allotted rooms in order of the receipt of registration, according to George J. Karl, chairman of the hotel committee, 126 Manhattan Avenue, Bridgeport, Conn.

* * *

Scovill Makes Rite-Line Copyholder. A recently patented copyholder, called "Rite-Line," adapted to hold all ordinary size sheets of paper, stenographers' note books or even larger bookkeeping sheets with the use of an

extension eye guide, is now being produced by the Scovill Manufacturing Company, Waterbury, for the Rite-Line Corporation, Shoreham Building, Washington, D. C.

As will be noted by the accompanying illustration, this new copy holding device which permits, with ease, the regulation of copy up or down a line at a time is a distinct innovation over any other type of devices of this nature. The Rite-Line is only 5 inches high, weighs but three pounds and takes only 3 x 6 inches of space on desk and can be conveniently carried from place to place or stored in a desk drawer at the close of a day's work. The color is a pleasing combination of soft green with

dull chrome. The spacing is done with a small spacer bar similar to that of a typewriter.

Each Rite-Line copyholder is supplied with one extension eye guide which can be secured in 8, 10, 15 or 20 inch lengths, depending on the requirements of the purchaser. Extra extension guides are supplied at 50 cents each. The machine is not fixed but can be turned in any position to suit the light or position of the operator.

This copyholder is an invention of Neil Burkinshaw, a brother of P. J. Burkinshaw, attached to the Secretary of State's office, State Capitol, Hartford. The product is already being distributed to dealers in a large number of states except certain eastern sections of the country.

* * *

Death of Henry F. Wanning. Mr. Henry F. Wanning, director and member of the executive committee of the Farrel-Birmingham Company, Inc., died at his home in Shelton, Conn., on Sunday morning, April 28th. In his passing there is lost one of the outstanding industrial figures in Connecticut whose life and work has profoundly influenced the growth and development of Shelton and Derby where he spent the greater portion of his life.

Mr. Wanning was born in Webster, Mass., March 30, 1846. Because of the early death of his father, who was a successful merchant in Webster, he began at a very early age to earn his living in his native city, but shortly afterwards moved to New York where he secured work with the New York Steel Company. In September, 1865, young Henry Wanning came to Derby (then called Birmingham) carrying with him a letter from the Steel Company's President, Mr. Ira Hersey, addressed to Mr. Royal M. Bassett, president of the then Birmingham Iron Foundry. He started his employment with this company almost immediately afterwards as bookkeeper, and his books, some of which are still in existence, attest to his accuracy, skill and neatness—attributes which were his to the very end of his life.

His marked ability earned him successively the offices of Secretary, Treasurer and Vice President and finally the presidency in 1891. He remained as president of the Birmingham Iron Foundry for 37 years, until 1927, when the company was merged with the Farrel Foundry and Machine Company of Ansonia to form the Farrel-Birmingham Company, Inc. (see "Rolls and Heavy Machinery" article starting page 3, this issue, for further details of Mr. Wanning's accomplishments with the Birmingham Iron Foundry). Mr. Wanning's business interests were not confined to the Birmingham Iron Foundry since he had been made director of the Birmingham National Bank as early as April 5, 1887, after which he served as vice president, president and chairman of the board. He also served the Home Trust Company as trustee, vice president and president.

For many years Mr. Wanning was affiliated with the Second Congregational Church of Derby and was a member of the Engineers' Club of New York, Quinnipiac Club of New Haven, and of the Derby and Shelton Board of Trade.

Funeral services were held from his late home Tuesday afternoon, April 30th, with interment in Oak Cliff Cemetery, Derby. The honorary pall bearers were business associates and the active pall bearers former employees of the Birmingham Iron Foundry.

* * *

Tercentenary Committee Increased. The Tercentenary Commission Manufacturers' Committee on Industrial Participation has recently been increased to include Gordon Harrower, Wauregan Quinebaug Mills, Inc., Danielson, Conn., and H. Stuart Hotchkiss, New Haven. Members of the Executive Committee are Clayton R. Burt, president of the Pratt and Whitney Company, Hartford; Dudley S. Ingraham, vice president of the E. Ingraham Company, Bristol, and Charles L. Taylor, president of Taylor and Fenn Company, Hartford. The names of other members of the committee were listed on page 12 of *Connecticut Industry* for May.

* * *

Death of Alfred E. Hammer. Alfred E. Hammer, 77, president and general manager of the Malleable Iron Fittings Company of Branford, died on May 9 of a heart ailment from which he had been ill for two months. His brother Valdemar T. Hammer also an executive of the Malleable Iron Fittings Company had died suddenly on April 8th.

Alfred E. Hammer was a native of Boston, coming to Branford as a boy. He had been associated in an executive capacity with the Malleable Iron Fittings Company during his entire life. He was a former State Representative and Senator, serving in the Lower House of the General Assembly in 1889 and in the Senate of 1907. He was made president of his company in February, 1921. Mr. Hammer was also a senior director of the Second National Bank of Branford and one of the trustees and incorporators of the Connecticut Savings Bank. He is credited with having been the first to bring the process of making "black heart" malleable castings to an exact science through working out the required chemical equilibrium.

Mr. Hammer leaves his wife, two sons, two daughters, a sister and nine grandchildren.

DEPARTMENTS

Accounting Hints for Management

Contributed by Hartford Chapter N. A. C. A.

Knoeppel Talks on Profitgraph. Hartford Chapter, N. A. C. A., recently devoted an entire meeting to a discussion of the Profitgraph. C. E. Knoeppel, a consulting industrial engineer having many years of varied experience was the speaker for the occasion. The speaker was the originator of this graphic method of portraying operating factors and results.

The profitgraph was described at length in an earlier issue of *Connecticut Industry*. As a means of assisting management towards guiding their business, it is a very useful tool and was very clearly described as such by Mr. Knoeppel. Briefly, the profitgraph is a chart of the sales line and the cost line of any particular business. Where these two lines intersect is the break-even point or the point where profits cease and losses begin or vice versa. The important feature of establishing such a method of control is to determine for any particular business, the variable expense and the fixed expense. The fixed expense is always one of the most pernicious handicaps to a profitable business. The accurate determination of the fixed expense is necessary in order to determine in what direction the business is headed. The relationship between the fixed and variable expenses pictured on the chart will bring home to any intelligent manager just where the business stands as to sales volume to overcome this handicap. With emphasis focused on fixed overehad, executives are faced squarely with the issue of how to control it, or what sales volume is necessary to absorb it.

Undoubtedly one of the greatest disputes between management and cost accountants is the practical application of the difference between an actual or current cost and a normal cost. Usually when a cost is required by an executive, it is supposed that an actual cost will be submitted. Generally this is the only kind of a cost that management understands. However, the accountant will maintain that a normal cost should be used, especially under intensely abnormal conditions. A normal cost is nothing more or less than one based on average conditions in any business, making the proper allowances for current cost on material and labor. The profitgraph clearly illustrates how essential it is to use a normal cost in establishing selling prices.

Mr. Knoeppel also stressed the need for the engineering approach to business problems. Throughout his talk, he emphasized the necessity for more scientific search and investigation into each industry. In his opinion, business today has been built up through leaders rising from the bench or through the sales end to management control. The change in character of business structure requires that management be amplified by a more studious approach to economic and practical business problems.

The value to the executive of such an easily understood picture of what his business will do, under the conditions as forecasted, is that he is presented with a definite target to shoot at—an objective to reach. The results of his efforts can be projected at him graphically so that he can definitely tell whether or not his aim is improving, and if not, where his weaknesses are, so that he can take corrective steps. He knows in a general way that if his sales volume decreases below the budget he must cut his costs and decrease his expenses if his company is to show a profit, but lowering costs and expense is a vague concept unless the manager of a business knows where and when to begin.

For the concern of moderate size, the primary requisite for the preparation of the profitgraph is a method of costing sales that will accurately tell the direct material, direct labor and factory overhead in the product sold. The remainder of expense is comparatively easy to obtain in proper classifications from any well ordered set of books.

It is gratifying to those accountants who prepare profitgraphs to see the stimulation given to their executives to "beat the budget"; to lower the ratio of sales dollar components. Executives study with a new zeal the operating results of their businesses presented to them in this manner.

Cost Accountants' National Convention in New England. The National Association of Cost Accountants has selected Boston for its 16th Annual Convention, which will be held at the Statler Hotel, June 24 to 27. Sizeable delegations will attend from the three Connecticut Chapters: Hartford, New Haven and Bridgeport. "Experience with Uniform Accounting," "Control Through Accounting and the Flexible Budget" and "Controversial Cost Subjects" are some of the topics scheduled for discussion.

Transportation

Rail Legislation Threatens. In the opinion of many traffic and railroad men, the railroads of the country are faced with serious breakdown and possible bankruptcy leading to government ownership, if a number of bills now pending in Congress are enacted into law.

Some of the most drastic of these bills, now being heard by a sub-committee of the Senate Interstate Commerce Committee, headed by Senator Lonergan, are the 6 Hour Day Bill, the Train Length Bill and the Full Crew Bill which, it has been pointed out, would add not less than $600,000,000 a year to the cost of operating the railroads of the country even though they handled no more business than in the low level years of 1932 and 1933.

The enactment of other bills such as those dealing with Hours of Service Limits, Government Track Inspection and Government Signal Inspection would add to the operating expense of the railroads several hundred million dollars more, bringing the total to well over an estimated $1,000,000,000 or twice the entire amount of interest paid by the railroads on their total funded and unfunded debt.

In New England alone, it is claimed, that the passage of the 6 Hour Day Bill will increase operating costs an estimated $23,925,000 which exceeds by $7,814,000 the entire net operating revenue of New England railroads for the year 1934. Such an overwhelming artificial increase in rail operating costs would quickly lead to bankruptcy of New England and the other railroads of the country. The shock to commerce and credit which would follow wholesale railroad default, involving one tenth of the productive capital of the United States, would be nothing short of

a national calamity affecting the entire fabric of the country's business.

One of the obvious objectives of these bills is to "make work" so long as the railroads are able to meet the payrolls, and when they are not, the government will own the nation's biggest industry. The other is obviously to assist the active propaganda for government ownership, by forcing the railroads into such a poor service condition that public opinion may be swayed in that direction.

Only the strongest opposition from business men and shippers, it appears, may be counted upon to stop the passage of at least some of these bills, and the subsequent serious consequences which would follow their enactment.

* * *

Truck Strike Settled. Settlement of the 17 day strike of truck drivers in Connecticut occurred late Wednesday night, May 9, after an agreement was reached in New York City on the afternoon of the same day when both strikers and truck owners met before two mediators of the New York Labor Department. The agreement is practically the same as the one refused by the drivers the previous week when they met with the operators and Commissioner Joseph M. Tone of the Connecticut State Labor Department.

In the settlement, drivers were given slight wage increases, overtime allowances and other concessions, but the operators refused to agree to a closed shop such as the strikers demanded at the start of the strike.

The strike is said to have caused a loss of approximately one-half million dollars to operators and also will mean temporary loss of jobs to a number of strikers until such time as the business lost to the operators during the strike can be recovered.

* * *

New Haven Tries Out "Comet" Train. The Comet, new streamline train of the New York, New Haven and Hartford Railroad Company, arrived in New Haven from its makers, the Goodyear-Zeppelin Corporation of Akron, Ohio, on Sunday, April 28, and the following day left New Haven for its trial run with officials of the company, "Fire Chief" Ed Wynn, the screen and stage comedian, on board.

The outstanding features of the new Comet train powered by two Diesel engines, one at each end of the train which eliminates the necessity for turn around at terminals, are as follows:

1. shock absorbers and complete air conditioning.
2. easy cruising speed of 90 miles an hour, a maxmium speed of over 100 miles an hour.
3. especially designed brakes with automatic deceleration control to insure smooth, rapid stops.
4. quietness, assured by special care in insulation accomplished by the use of aluminum and hair felt with half inch cork, the latter used in the floor.
5. new type of construction in the form of a tube with flat sides and well arched roof, so designed as to permit every portion of the outer "shell" to carry its equal portion of the stress-carrying element of the whole.
6. beautiful appearance both inside and out with four alternate bands of blue and silver running the entire length of the train which measures 207 feet from tip to tip. Bright polished aluminum appears above the windows, a bright ultramarine blue between the windows, a band of shiny aluminum below the windows, and a final bottom band of somewhat darker blue. Tan is the predominating motif of the interiors. The seats, framed in aluminum, are upholstered in rust-colored closed-loop mohair.
7. The two end cars are each 74 feet 2 inches long, and the center car 58 feet 8 inches, while the tops of the cars are only 10 feet 11 inches above the rails, except over the power plants where they rise to 11 feet 3 inches. The bottoms of the cars, which are smooth and rounded, are only 10 inches above the rails, which results in a center of gravity approximately 20 inches nearer the rails than standard railroad cars, making possible higher speed without any sacrifice of safety.
8. Indirect lighting.

Those who have traveled on the new train report their ride as a distinct sensation in riding comfort. After making inspection tours stopping at the principal towns on the New Haven road, the train will be placed in regular service between Providence and Boston.

* * *

New Haven Speeds Up Trains. The New Haven Road's new schedule which went into effect, Sunday, April 28 and made adjustments to Daylight Saving Time, speeded up many trains and made a number of changes including the restoration of the New York-Boston night train, and a fare reduction on the company's electric suburban line out of Providence. Because of the many changes which have been made in schedules and trains it is imperative that travelers consult the new time table before attempting future trips.

* * *

Governors Meet—New Rail Committee Appointed. Meeting at The Hartford Club on April 25 as guests of Governor Gross, five New England governors and Governor Cross passed two resolutions: one creating a committee of 12 on New England Railroads, consisting of the Governors of the 6 New England states and a representative from each of the states; and second that the Governor's committee should immediately consider:

1. Consolidation between the Boston and Maine and New York Central lines on the one hand, and between the New York, New Haven and Hartford and the Pennsylvania Road on the other.
2. Unification of New England railroads with a single operating head and a stock trusteeship to be appointed by the Governors and the I. C. C.
3. Independent operation of the individual railroads, or other such combinations as the committee might deem wise to recommend to the governors for their consideration.
4. Such other plans that they may deem advisable for New England transportation systems.

Several meetings of the Governor's committee have been held and one report of recommendation made at the last meeting on May 16, to which Mr. E. Kent Hubbard, Governor Cross's representative on the committee, disagreed. Before these lines are in print another meeting will have been held at Greenville, Maine, on May 25, to which has been invited Jesse H. Jones, chairman of the Reconstruction Finance Corporation. If a compromise is not reached at this meeting, it is expected that both the majority report or recommendation of the representatives of the five other New England states and the minority report of Connecticut by Mr. Hubbard will be released.

A digest of the results of this meeting will appear in this department in the July issue.

Foreign Trade

Association Observes National Foreign Trade Week. Since the Los Angeles Chamber of Commerce set aside one week several years ago, to call attention to the people of that city to the growing importance of its seaport, Foreign Trade Week has been nationalized and observed by associations and other organizations throughout the nation.

The Association will observe Foreign Trade Week on Friday, May 24, when Mr. Harry Tipper, executive vice president of the American Manufacturers' Export Association will address a meeting of the Foreign Trade Committee and others interested in the subject. Another attraction at this meeting will be the showing of the Pan-American Airways' film, "Flying the Lindbergh Trail."

In celebrating National Foreign Trade Week, it is the hope of the Association, which maintains a branch office of the United States Bureau of Foreign and Domestic Commerce, with a secretary, at its headquarters, that such observance will result in a more thorough understanding of what foreign trade means to the average citizen, a more neighborly attitude towards foreign business men and officials, and in general, promote a greater eagerness to understand America's relationship with the remainder of the world.

France Assures U. S. Trade Equality. A near breakdown in a conference looking toward a reciprocal trade treaty between France and The United States, was narrowly averted on April 30, when France promised to afford equality of treatment to American exports valued at more than $115,000,000. Secretary Hull stated that the two countries had agreed on fundamentals and their actual negotiations of the pact, designed to lower tariffs and eradicate discriminatory decrees and other trade barriers, would begin after public hearing June 24.

Secretary Hull had previously warned France that she would not be given concessions granted to other countries as a result of 18 trade pacts now concluded or under negotiation, unless she removed discriminations against American products.

Federal and State Legislation

(Continued from page 2)

State

So great is the legislative jam in the closing days of the General Assembly, which adjourns by constitutional statute on June 5, that Saturday and Monday sessions started on May 25 in a feverish attempt to clear up the tax jam, hours of labor bills, liquor, workmen's compensation and numerous other controversial measures, before the end of the session. Dozens of bills are certain to die in committee.

Sales Tax. This was defeated by a margin of one vote in the Senate, May 23, and seems likely to meet a similar fate in the House. Insistence upon insertion of income tax by Socialists in Senate and upon exemption of food products by Democrats caused the downfall of the Sales Tax which was estimated to net $8 million to the state for distribution to towns for relief. Unincorporated business tax, insurance premium tax, cigarette tax and miscellaneous corporation tax may run the gauntlet, but from present indications, a new bill may be brought out of Judiciary committee which will provide for using state highway funds for town relief.

Hours of Labor. A strong fight to reduce the working hours for women below the present legal limit of 55 per week has been waged by the Socialists, Democrats and a number of Republicans. The first bill proposed by the Connecticut Federation of Labor was for 40 hours and an 8 hour day, but later concessions have been a 48 hour week 8 hour day bill and a 50 hour week 9 hour day bill, the latter having a leeway up to 55 in an emergency if approved by labor department.

At this writing a 48 hour bill seems certain to pass the Senate and has a good possibility in the House unless an appreciable number of legislators are prevailed upon to withhold this additional "halter" from Connecticut industry which must compete with concerns in other states which may work longer hours if necessary.

A bill prohibiting employment of persons under 16 years in factories and under 18 in hazardous occupations has passed the General Assembly, but the Federal Child Labor amendment was turned down.

A number of other labor bills are still in committee, among which is the bill which would prevent the use of injunctions in labor disputes. The bill to prevent the use of state police in strike disturbances as well as the one repealing the intimidation and boycott statute has been defeated.

Unemployment Insurance. Still in committee with apparently little possibility of passage at this session.

Compensation Insurance. Number of amendment proposals to present Workmen's Compensation Act still in committee in the form of an undrafted omnibus bill. Certain of these proposals which improve the present act have been approved by the Association. (See Page 3, Legislative Report 32—May 17.)

Motor Truck Regulation. Passed in April but to date no appropriation has yet been granted by Appropriations Committee for carrying out the work. Private motor trucks of manufacturers are not affected.

Motor Vehicle Bills. The bill sponsored by Commissioner Connor to change fee basis on registrations of passenger cars from piston displacement basis to a classification of $7, $9 and $11 depending upon weight, and the reduction of commercial registration fees approximately 1/3 have been reported favorably by the Motor Vehicle Committee. The plan would provide for the deficit by adding 1 cent to the gasoline tax. It is likely to be enacted.

Motor vehicle bills calling for reduction in weight, length, width and height of motor trucks have been defeated.

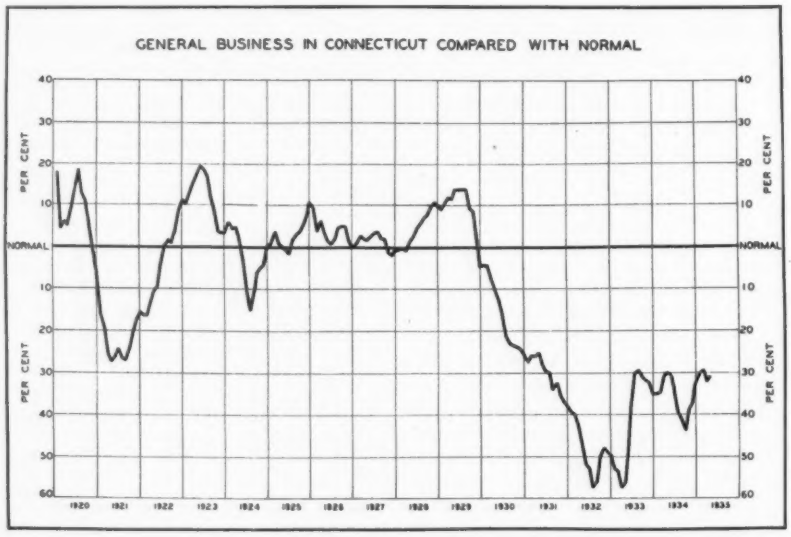
Reorganization Bill. Bill to provide for reorganization of state departments passed.

Explosives. Bill desired by certain manufacturers to regulate the transportation is on the way to become law.

Summary. Shortly after the close of the session, members will receive a comprehensive report of all bills that could possibly be of interest to them.

BUSINESS PATTERN

General Summary. During April general business activity in Connecticut stood at 31% below normal compared with 32% below in March. The increase in business activity was participated in by all but two of the components of the general business index. The number of man-hours worked in Connecticut factories decreased considerably less than the usual seasonal amount and employment in factories in Waterbury and Hartford was also slightly better than in March. Activity in Connecticut cotton mills, contrary to the trend which prevailed in the United States as a whole, increased sharply over the preceding month, and metal tonnage carried by the New Haven Road and bank debits to individual accounts also improved moderately. On the other hand, the number of freight car-loadings originating in 14 Connecticut cities increased less than seasonally over March. Information available for the first third of May indicated a continuation of the horizontal level in general business activity that has prevailed since December.



General business activity in the United States declined rather sharply in April as a result of moderate decreases in the majority of items composing the overall index. Freight car-loadings declined abruptly, coincident with the sharp reduction in shipments of bituminous coal. Smaller decreases were reported in the production of pig iron and steel and electric power. The consumption of raw cotton and silk was also well below the level of March. Automobile production continued to increase and the total for April was the highest for that month on record with the exception of 1929. During the first four months of this year the output of automobiles was 40% higher than in the same period of last year. During the week of May 11th production schedules were interrupted by strikes which brought about the closing of assembly plants so that production that week was some 23,000 units lower than in the previous 7 days. However, with the settlement of the strikes, production was expected to return to the earlier levels. The weekly business index of the New York Times moved irregularly downward during the latter part of April and the first weeks of May largely as a result of several abnormal factors including strikes in the automobile and lumber industries, advances in freight rates and curtailment and recovery in the cotton goods industry.

During April, the trend of wholesale commodity prices continued upward and on May 4 the index of wholesale prices compiled by the United States Bureau of Labor was 1% higher than 4 weeks earlier. During this period the prices of farm products rose 3%, hides and leather goods 3% and food 2½%. Compared with last year, the index of all prices advanced 9% due entirely to increases of 37% in farm products and 28% in the prices of food, all other commodities declined 2%.

During April, the cost of living in the United States increased 1% over March because of advances of 2½% in the price of food and 1% in the cost of rent. The retail cost of clothes and fuel and light was 1% below the level of March. The cost of rent which advanced 9½% from the low point in 1934 was at the highest level since October, 1932.

Finance. The number of business failures in Connecticut and the gross liabilities of failures continued at a high level during the four weeks ended May 11. On the other hand, the total number of new corporations formed remained abnormally low and was 30% below the corresponding period of last year. The number of real estate sales was approximately the same as last year.

Construction. Building activity in Connecticut increased further during April and the first part of May, and was higher than for any corresponding period since 1931. New residential building was particularly active in West Hart-

ford. On April 25, the general contract was awarded for a new Post Office in Fairfield to cost $100,000 and on May 14, the general contract was awarded for a new factory in Stratford covering approximately 71,000 square feet of floor space.

The total value of building contracts awarded in 37 eastern states, according to the F. W. Dodge Corporation, increased less than seasonally expected in April and was 5% below April, 1934. New residential building, however, showed marked improvement for the second consecutive month, the value of residential contracts awarded being 86% above a year previous and at the highest level, seasonally corrected, since January, 1932. Non-residential building, largely because of a decrease in public works projects, was considerably below last year.

Labor and Industry. Manufacturing activity in Connecticut plants decreased less than seasonally during April and as a result the seasonally adjusted index of the number of man-hours worked advanced to 28% below normal compared with 29% below in March and 31% below a year earlier. This index was higher than at any time since December, 1930. The number of man-hours worked in Bridgeport and Bristol factories advanced contrary to the usual seasonal trend and was 6% and 3%, respectively, above last year. In New Britain and New Haven there was a slight decrease. Activity in New Britain was slightly below last year, while in New Haven a 5% increase was shown. Employment in Hartford factories expanded further, but in Waterbury and Torrington a slight contraction took place. In Hartford and Torrington employment was still ahead of a year earlier but in the Waterbury plants there was a decrease of 9% during the past 12 months.

Trade. Retail trade in the United States reacted sharply in April due largely to unfavorable weather during the Easter buying period. The index of sales by department stores, prepared by the United States Federal Reserve Board, fell in April to 74% of the 1923-1925 average compared with 82% in March.

Transportation. As mentioned above, there was a slight decrease in the adjusted index of freight car-loadings originating in Connecticut cities during April. The index declined to 42% below normal against 41% below in March. Loadings of automobiles declined slightly contrary to the usual seasonal trend and there was a sharp reduction in bituminous coal. Loadings of building material increased in line with the usual seasonal trend and the movement of merchandise in less than car-load lots also expanded.

Does It Do Any Good To Write?

(Continued from page 1)

greater number of vertebrae of the backbone of the nation. It is incumbent upon manufacturers to bring the members of Congress to a realization of this fact. That can be done only by acquainting them with the facts; but communications should be sent only by those who understand whereof they speak. Few Senators and Representatives will ignore the opinion of the informed.

Yes, it does do some good to communicate with your Senators and Representatives, and it is your duty to do so.

SERVICE SECTION

On account of space limitations, the material and used equipment items offered for sale by Association members have not been classified by sizes or usage best adapted. Full information will be given on receipt of inquiry. Listing service free to member concerns.

●● Materials for Sale

COLD rolled steel in coils and in squares, condulets and fittings, remnants of covering materials—velours, velvets, mohair, tapestries, denims, chintzes, and cretonnes, semi-finished and castellated U. S. S. nuts, pulleys, flat and crown face-steel and cast-iron; new shaft hangers, brass wire, brass rods, aluminum tubing, cold drawn steel—mostly hex; miscellaneous lot of material used in the manufacture of molded rubber parts and flooring, knife switches—new and many sizes; carload C. I. drop bases; lead pipe, lead sheet, acid proof pipe fittings, 124 bars screw stock varying thicknesses and lengths, white absorbent tissue process from cotton, rotary convertor, colors and dyes—large variety, lacquers—several hundred gallons in assorted colors; and soft anneal copper with high silver content in rolls. J. H. Williams wrenches in assorted sizes.

●● Equipment for Sale

ACCUMULATORS, annunciators, baskets, beaders, beamers, bearings, belt stretchers, blowers, boilers, braiders, bronze runners, cans, cards, woolen; car loaders, chain, chairs, chamfer, clocks, time recorders; clock systems, colors and dyes, compressors, condulets, convertors, conveyors, cookers, cooking utensils, doublers, draftsman's table, drop hammers, drops, board; drums, drying racks, dyes, engines, evaporators, extractors or percolators, fans, filtering carbon, folders, forming rolls, frames, furnaces, gears, generators, grinders, grindstones, grinding wheels, guiders, headers, lamp shades, lathes, lifters, looms, De Laski circular; machines, automatic; machines, calculating; machines, compressing; machines, dieing; machines, drilling; machines, filing; machines, filling; machines, folding; machines, knitting; machines, mercerizing; machines, milling; machines, pipe-cutting and threading; machines, pleating down; machines, riveting; machines, screw; machines, threading; machines, tongue and groove; machines, washing; mercerizer equipment; millers, mixers, mills, mills rubber; mixing rolls, motors, oil circuits; oven drawers, paints and lacquers; panels, planers, plungers, pointers, presses, profilers, pulley drives, pumps, reamers, receivers, rheostats, safe cabinets, saws, scales, screens, seamers, shapers, shears, spindles, spinning mules, steam tables, steam warmers, stitcher, 192 monitor corner box switches, tables, tanks, toilet equpiment,' trucks, ash can; tube closers; wire, wire screw and yarders.

●● For Sale or Rent

FOR SALE. One 3½ Bliss toggle press in good condition. Address S. E. 76.

FOR SALE. 1 Bigelow H. R. T. boiler. 53 B. H. P. Will pass inspection. With fittings. Address S. E. 79.

FOR SALE—Free Cutting Bessemer Screw Stock of various sizes ranging from 7/16" to 5" in Rounds; 1⅛" to 1½" in Squares; and ⅞" to 2" in Hexagons. Also Cold Rolled Steel ½" x ⅛" to 3½" x ¼". Address S. E. 80.

FOR SALE. One N. C. Grindstone 72" diameter x 12" face, brand new and offered for sale at reasonable price by company which has discontinued use of grindstones. Address S. E. 86.

FOR SALE. One No. 94 Monarch Oil Burning Furnace, 2,000 lbs. capacity, complete with all accessories including electrical equipment. Address S. E. 90.

●● Wanted to Buy

WANTED, USED—1 Portable Recording Wattmeter, 3 Phase, 3 Wire, 60 Cycles, 230 and 575 Volts, 5 Amperes, Synchronous Motor Drive (1" per hour and 1" per minute suggested); 2 Current Transformers for above, 20-25-40-50-800-1,000 Ampere Rating; 1 600-KVA, 440 Volt, 3 Phase, 600 RPM Alternating Current Generator, with Exciter; Exciter preferably directly connected to Generator. Generator must have amortisseur windings. Address S. E. 87.

WANTED—MANUFACTURER OF SHEET METAL PRODUCTS, who desires to consolidate his business with another growing concern which now sells its own sheet metal products to chain stores and mail order houses. If interested in talking over consolidation address a letter to S. E. 88.

NEW PRODUCTS WANTED. A well equipped established Connecticut manufacturer wants to acquire additional lines of metal products or tools having a normal manufacturing season during the summer and early Fall months. Would prefer an established line that can be distributed through the hardware trade. Address your offerings to S. E. 89.

●● Employment

ACCOUNTANT. Experienced in general accounting and cost work. Would like experience with auditing firm as junior or semi-senior. Age 32 and married. Salary requirements moderate. Address P. W. 275.

POSITION WANTED. Chemical Engineer, Tufts 1934, desires connection with firm in chemical, engineering or sales capacity. No practical experience. Past seven months spent in foreign travel. Very nominal salary accepted at start. Address P. W. 285.

PRODUCTION MANAGER. Trained by and worked on personal staff of H. L. Gantt. Experienced in production control, budgeting and control of inventories to effect turnover, and coordination of plant production with sales budgets. Have installed standard costs. Understand, but have not specialized on rate setting. Experience mostly in textiles but fundamentally fitted for any industry. Address P. W. 287.

OFFICE MANAGER, PAYMASTER OR EMPLOYMENT MANAGER. Married man with good business training and over 20 years' experience in various types of office work with manufacturing establishments, railroads and state commissions, finds it necessary to seek new connections because of closing out the business of last employer. His experience covers such positions as cashier and correspondence, paymaster, employment manager, supervisor of stock records department, office manager and purchasing agent. In the prime of life, this man is in a position to give intelligent, conscientious service for reasonable returns for the next 20 to 25 years. For reference or interview appointment address P. W. 290.

CHEMICAL ENGINEER. Young man, graduate of Wesleyan and Yale Universities with B. S., M. S. and Doctor's degree in chemistry, who has been employed for 2½ years as a Development and Research Chemical Engineer, now seeks a new opportunity because of the curtailment of research activity by his present employer. Employer speaks in high praise of his ability, personality and habits. Companies planning to expand their research or laboratory work would do well to write for further details and appointment. Address P. W. 291.

JUNIOR ACCOUNTANT. Young High School graduate who has completed a nine months' course in accounting at a reputable business college where training included cost accounting and payroll auditing, is earnestly seeking a position in the accounting department of an industrial or commercial establishment, public accounting firm or for the time being will accept any clerical opportunity. For further details address P. W. 292.

SUPERINTENDENT, PRODUCTION MANAGER OR FOREMAN. Married man who has advanced himself from a clerk to various production positions to become superintendent in a large metal working plant, seeks any type of a production position in Connecticut or New England concern where there is a reasonable opportunity for advancement in regular employment. Has had experience in foundry work, both brass and iron, plating, finishing, lacquering, buffing, polishing, rolling, machining, press work, assembling and numerous other productive operations. For further particulars and interview address P. W. 293.

MACHINE DESIGNER, who has completed design for fruit press, embodying entirely new principle wishes to interest manufacturer in building press. Very small investment required. Address P. W. 294.

FARREL

REG. U.S. PAT. OFF.

FARREL MEEHANITE

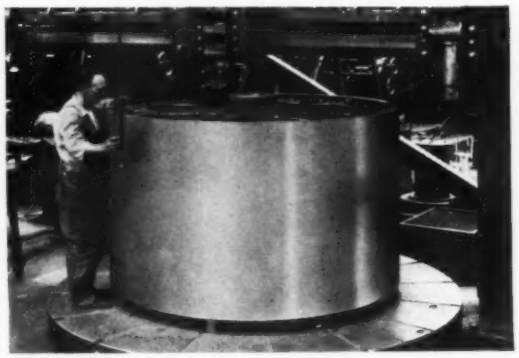
Farrel Meehanite is an ideal metal for many types of castings because it is superior to grey iron or semi-steel and is less expensive than steel.

It is a processed metal of high strength, close grain and unusual wearing properties; and can be furnished with a guaranteed minimum tensile strength of 50,000 pounds per square inch. Its resistance to impact is two to three times greater than semi-steel.

Special compositions of Meehanite can be provided to resist either wear, high temperatures or corrosion.

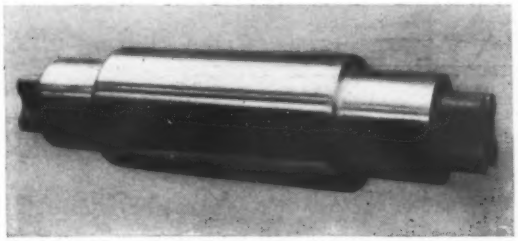
Meehanite is produced to definite specifications under the most accurate metallurgical control to obtain the qualities required for specific purposes.

Send for descriptive literature or have our representative call to discuss the advantages of Meehanite for your casting requirements.



This 10 ft. dia. x 4 ft. face drum is made of Meehanite. It has a close, uniform grain structure and machines freely.

FARREL NI-HARD ROLLS



A 20" x 42" Farrel Ni-Hard Roll for finishing non-ferrous sheets.

Farrel Ni-Hard Rolls have been developed to meet the demand of the metal rolling industries for a roll combining hardness with high strength and a surface free from pinholes, "orange peel," or other imperfections which mark the surface of the sheet.

They are alloy chilled iron rolls containing nickel and chromium but the composition is only one important part of the process of manufacture. They are the result of long and careful study and experimentation to develop correct mixture, melting practice and heat treatment.

Each step in the manufacturing process is subject to scientific control, including analysis of materials, controlled melting in an electric furnace, precise heat treatment, physical tests and microphotographs.

The performance of Farrel Ni-Hard Rolls in a number of metal rolling mills has definitely proved their superiority. Their greater hardness and better surface produces a sheet with a better surface, and their greater strength results in increased production by permitting heavier passes.

FARREL-BIRMINGHAM COMPANY, INC.

ANSONIA, CONN.

FARREL-BIRMINGHAM PRODUCTS include: Heavy Machinery and Rolls for Rubber, Plastics, Paper, Metal, Cane Sugar and other Industries—Castings for all purposes from one pound to seventy tons in weight. Gears and Gear Units for all types of service.